

# AMERICAN ARTISAN

RESIDENTIAL AIR CONDITIONING  
WARM AIR HEATING • SHEET METAL CONTRACTING

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# An OPEN LETTER to Sheet Metal Contractors

## LAMNECK PRODUCTS, Inc.



HEATING EQUIPMENT  
SIMPLIFIED FURNACE PIPE AND FITTINGS, AIR  
CONDITIONING DUCT AND FITTINGS, GRAVITY  
AND AIR CONDITIONING REGISTERS AND GRILLES.

MIDDLETOWN, OHIO

FARM EQUIPMENT  
"BUCKEYE" METAL CORN CRIBS AND GRAIN BINS.  
"SILVER SHIELD" METAL SILOS, ROOFS AND SILO  
ACCESSORIES, TANKS, TROUGHS AND FOUNTAINS.

Gentlemen:

Our country at war needs and must have many materials and work hours ordinarily consumed in normal residential construction.

Homes and shelter for our workers in war industries must be provided as our Government directs. Both Lamneck Products and Lamneck customers stand alert and able to meet with cheerful dispatch such tasks as are allotted to them.

You may rest assured that our Government will allocate to us from time to time such materials as are proper for use in housing construction which will best support the united war effort.

We, here at Lamneck, again gladly and proudly pledge our best and complete cooperation to our Government, to the industry, and to you, our valued customers.

Yours very truly  
LAMNECK PRODUCTS, INC.

Perl S. Miller,  
President

PSM/PCF

### LAMNECK PRODUCTS INC. Middletown, Ohio

*Simplified Furnace Pipe and Fittings and Prefabricated Duct and Fittings for all Types of Residential Gravity and Forced Warm Air Heating and Air Conditioning Systems.*



TS 200  
. A7

# Beginning the 100th Year of Ryerson Steel-Service

Large and complete stocks, steel of known quality, prompt and dependable service . . . these are the rugged cornerstones on which the Ryerson business has been built. 100 years of experience is at the disposal of Ryerson customers to help them meet every steel problem. Today, our stock in many lines is depleted and war needs have the right of way. However, we continue to serve every customer to the best of our ability in accordance with the Government Program. Joseph T. Ryerson & Son, Inc., Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

---

#### RYERSON STOCKS

*include:*

Beams and Heavy Structural  
Channels, Angles, Tees and Zees  
Rails, Spikes, Bolts, etc.  
Plates and Sheets  
Hot Rolled Bars, Hoops and Bands  
Cold Finished Shafting  
Alloy and Tool Steels  
Heat Treated Alloy Steels  
Strip Steel, Flat Wire, etc.  
Stainless Steel  
Mechanical Tubing  
Boiler Tubes and Fittings  
Welding Rod, Wire  
Rivets, Bolts, Nuts, Washers, etc.  
Concrete Reinforcing Bars  
Babbitt Metal and Solder

---

## RYERSON

*Certified*



## STEELS

# AMERICAN ARTISAN

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

WITH WHICH ARE MERGED

FURNACES  
AND  
SHEET METALS

AND

Warm-Air  
Heating

J. D. Wilder, Editor

A. A. Kennedy, Assistant Editor

Vol. 111, No. 1

January, 1942

Founded 1880

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## In This Issue

WHEREAS in 1940 the activity which attracted most attention in warm air heating circles was the heating of the army camp barracks with warm air furnaces, the most interesting activities of 1941 were probably the heating with forced warm air furnaces of FWA's public housing projects and the warm air heating of the tens of thousands of small, single houses built for defense workers and families of men in the armed forces.

To report trends, ideas, and results with furnace heating in very small homes, American Artisan began in the August issue a series of job descriptions picturing and explaining these space and material saving installations. Each issue following carried one such report—this editorial coverage of a vitally interesting activity will be continued all through 1942.

To explain the design and installation procedures used by contractors in public housing projects, the editors visited several projects and from these visits the article on page 99 was prepared. This report, we believe, emphasizes the size of these contracts, explains the plans which must be adopted profitably to complete such a contract and describes the methods contractors have found to be feasible.

We would also like to call attention to the survey of warm air panel heating in U. S. residences on page 113 because we feel that warm air panel heating has much merit and quite possibly may be a coming development.

And for readers who want to know what to expect in 1942, the prognostications by heads of the Federal housing agencies (page 92) and Arnold Kruckman's survey of 1942 housing needs (page 94) furnishes, we think, data to calculate from.

Member of Audit Bureau of Circulations — Member Associated Business Papers, Inc.

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**More than 8,000 copies of this issue are being distributed**

# TOPS *for Gravity* • IDEAL *for Conversion*

(GRAVITY TO AIR CONDITIONING)



## No. 130

H & C No. 130, with removable face, is the finest of gravity registers, combining as it does very attractive appearance (especially in the new Metalustre finish), large free area and remarkably low resistance. These factors, in conjunction with the easy adjustability of the flexible fins, make it the ideal register for *economically* converting existing gravity systems to air conditioning. Pointing out the two way advantage of the No. 130 will help you land many a job that otherwise might not come your way. Be wise, standardize on this outstanding baseboard register.

*Current Catalog: No. 42 combining Gravity Air Conditioning and Furnace Accessory Lines. If not on hand, write us.*

### HART & COOLEY MANUFACTURING CO.

Warm Air Registers • Air Conditioning Grilles • Damper Regulator Sets • Dampers • Chain • Pulleys

HOLLAND



MICHIGAN

Chicago Office: 61 W. Kinzie St.

Philadelphia Office: 1600 Arch St.



# MONCRIEF Introduces

## ★ ★ ★ Specially Designed

*... and for all small homes  
calling for dependable heating*

Moncrief equips its dealers to meet the present emergency and bid successfully for business by supplying them with these four furnaces specially designed for heating defense houses. These new units fulfill every specification for size, type, quality materials and low price. They are built, not only to meet present day needs, but also to give their owners ample heat and dependable service for many long years after the crisis is over.

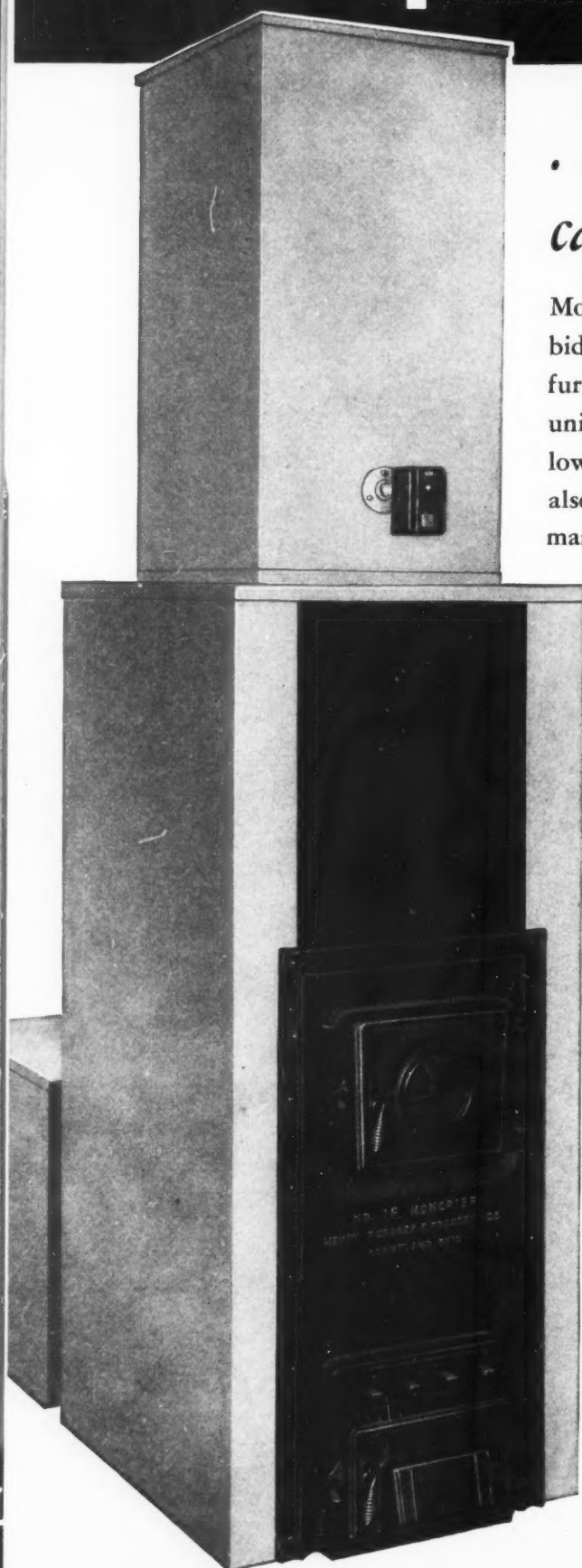
### **No. 16 Moncrief Forced Air Furnace (cast)**

This efficient, compact heating unit has the quality, the appearance and the heating ability that meets every specification, and its low price gives you a distinct advantage in bidding for defense jobs. Note these excellent features:

Cast iron heating element, sturdily built and smoothly finished, with better than 19 to 1 ratio. Openings of feed section and ashpit are cast integral with these sections. Large doors have ground edges. Slip-on cast front makes assembly easy. Four bar-grates. Cabinet, with inner liner construction, is finished in smooth, gray baked enamel. Efficient blower powered by  $\frac{1}{6}$  H. P. motor, governed by automatic control in plenum adapts it for basementless as well as basement homes. Capacity 60,000 B. t. u. Casing dimensions 26" x 26" x 60" high; blower cabinet 24" x 24".

### **No. 18 Moncrief Forced Air Furnace (steel)**

The same cabinet as No. 16 encloses welded steel furnace. Cast iron outlet is lined with inner flue sleeve. All sturdily built. Presents large radiating surface. High quality firebrick lined firepot. Duplex roller-bearing grates actuated by long upright shaker handle. Center dump crank-operated. Same blower and blower-cabinet as No. 16 with all the other good features and fine appearance.

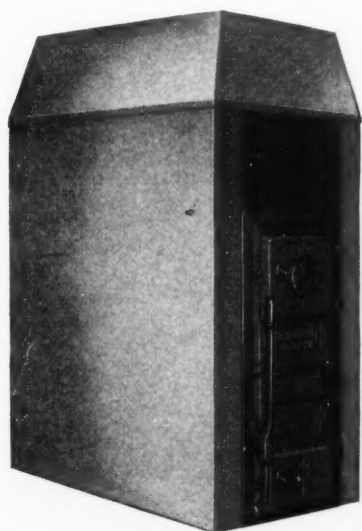
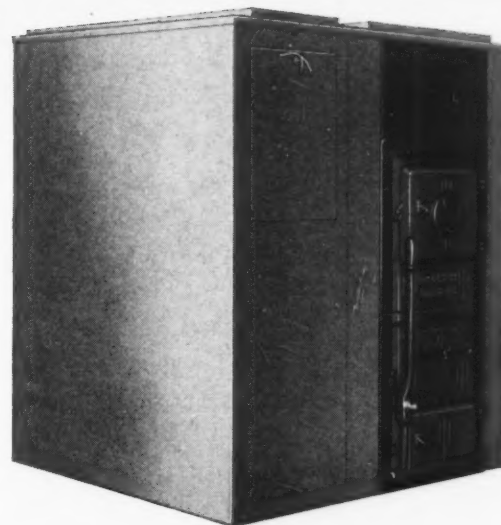




# FOUR NEW UNITS ★ ★ ★ ★ for DEFENSE HOUSES!

## No. FA-20 Moncrief Forced Air Furnace (steel)

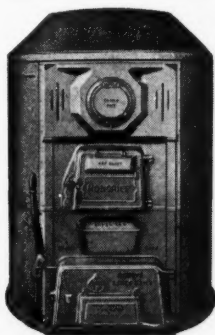
Here is a correctly designed, well-made forced air furnace specifically designed for basement installation in homes with heat requirements up to 80,000 B. t. u. Steel combustion drum is welded solidly to steel radiator, with cast iron liner inside the connection. Firepot lined with high-grade firebrick. Duplex roller-bearing grates. Cast front is finished in black. Cabinet is handsomely finished in smooth gray enamel. Access door is located in front for convenience. Squirrel cage blower is powered by  $\frac{1}{6}$  H. P. rubber mounted motor. Two replaceable-type filters.



## No. GC-20 Gravity Steel Furnace

This new gravity furnace is a worthy companion to No. FA-20 Forced Air Furnace, being substantially the same construction and finish, but without blower and filters. The same welded steel combustion drum and radiator make an exceptionally efficient heating unit, with full 20 to 1 ratio. Duplex roller-bearing grates, firebrick lined firepot, etc. Easy to install as cast front and casing go together without bolts.

**SEND FOR NEW  
DESCRIPTIVE  
★ LITERATURE ★  
AND PRICES**



### THESE TWO FAVORITES ARE STILL ON THE JOB FOR DEFENSE HOMES

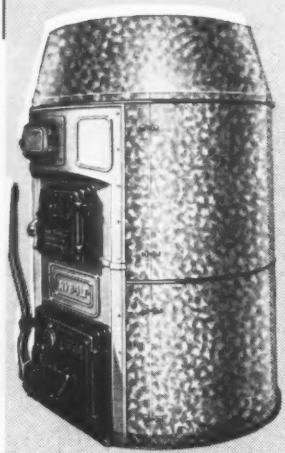
**SERIES C CAST.** Here's top quality with the famous Series C design and construction in 18", 20", 22" and 24" sizes—sections cast in one piece (two-piece firepot) heavy and smoothly finished; duplex roller-bearing grates, and all other fine features you expect in a high-grade furnace.

**SERIES D-40 STEEL.** Made in 20", 22" and 24" for defense houses requirements. Combustion drum is heavy O. H. steel with head riveted as well as welded. Large welded radiator. No bolt holes open into combustion chamber. A high-grade furnace in every particular.

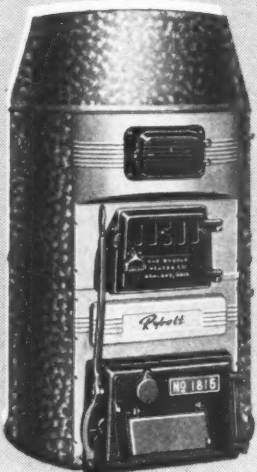


THE HENRY FURNACE & FOUNDRY CO. • 3473 E. 49th Street • CLEVELAND, OHIO

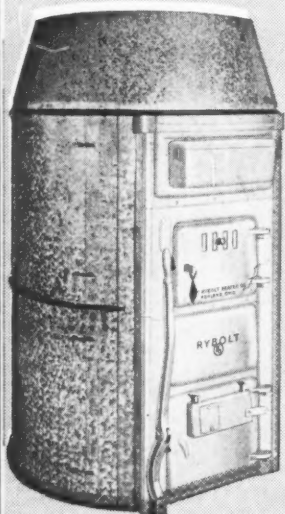
# RYBOLT



**RIES 15—Cast Iron, Coal-Fired Gravity Furnace**



**ES 1815—18" Cast Iron, Coal-Fired Gravity Furnace**



**ERIES 4000—Steel, Coal-Fired Gravity Furnace**

## A Modern Balanced Line to Meet Every Heating Need and Every Price Limit



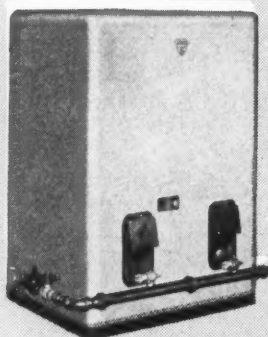
Important additions to the RYBOLT line during the past year have made it *more complete . . . more applicable* to increased standards of heating comfort and convenience . . . *more adaptable* to varied requirements of use, space, and price.

It is a *balanced line* including every type of unit from the more simple gravity furnaces to the most advanced automatic forced air unit with every modern feature. RYBOLT heating units come in all sizes . . . in steel or cast iron . . . fired by coal, gas, or oil. They are as attractive in design and finish as they are efficient, convenient, and economical.

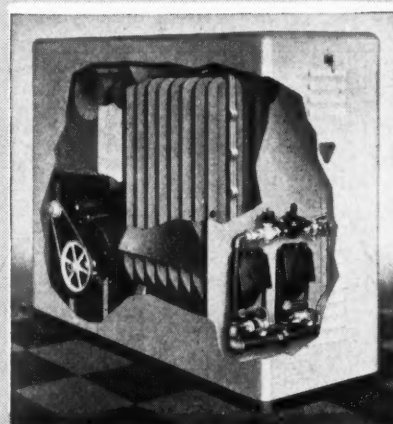
In all details they represent the distinctive quality achieved through the experience of a quarter century in the building of fine heating equipment.

In the diversity of the complete RYBOLT line the dealer is sure to find the particular unit required to give any customer utmost heating service and satisfaction.

**WRITE FOR** *complete descriptive literature.*



**SERIES CCG—Cast Iron, Gas-Fired Gravity Furnace**



**SERIES CG—Cast Iron, Gas-Fired Winter Air Conditioner**



# THE RYBOLT HEATER COMPANY



# The Complete Line

## OF FURNACES AND WINTER AIR CONDITIONERS—FIRED BY COAL, GAS, OR OIL

### Special Rybolt Units for Defense Housing and Low Cost Homes



The RYBOLT complete line for 1942 includes a number of units especially adapted to meet the exacting requirements of Defense Housing. Particular attention is directed to Series DH-70S for coal firing, Series RS gas-fired unit and Series RO oil-fired unit, all fully equipped Winter Air Conditioners which are compactly designed to fit in small space. They are highly efficient, yet low in price.

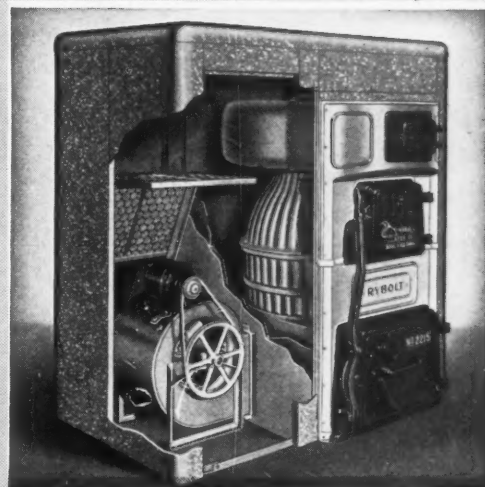
For the same purpose, Series 1815, the 18" coal-fired Gravity Furnace will give dependable and economical heating service where a still lower priced unit is indicated.

All of these units are dependable and will fully meet the heating requirements of small or medium sized homes at prices that will give the dealer the edge on competition in this low field.

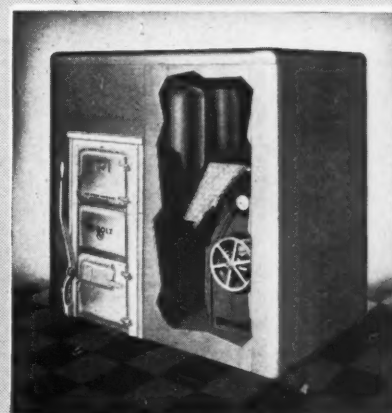
#### NOTICE TO JOBBERS

*Under present wartime conditions, our production capacity is taxed to the limit to meet the requirements of our regular customers to whom we feel we owe first consideration. In justice to them, therefore, and also*

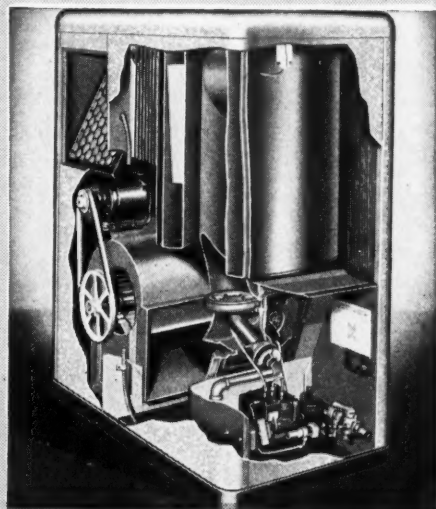
*because we desire to cooperate to the fullest extent with the NATIONAL DEFENSE PROGRAM, we are not in position at this time to consider any new distribution outlets, except in connection with orders for defense business.*



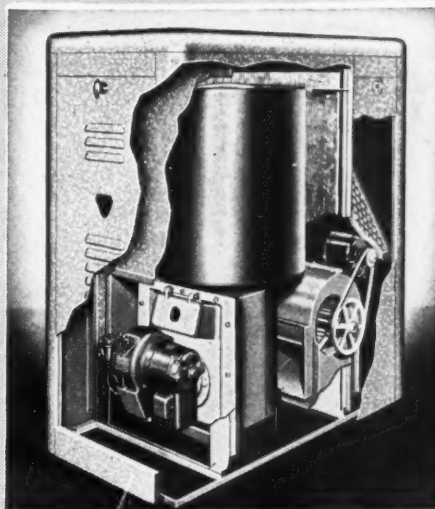
**SERIES 151—Cast Iron, Coal-Fired Winter Air Conditioner**



**SERIES 4200—Steel, Coal-Fired Winter Air Conditioner**



**SERIES RS—Steel, Gas-Fired Winter Air Conditioner**



**SERIES RO—Steel, Oil-Fired Winter Air Conditioner**

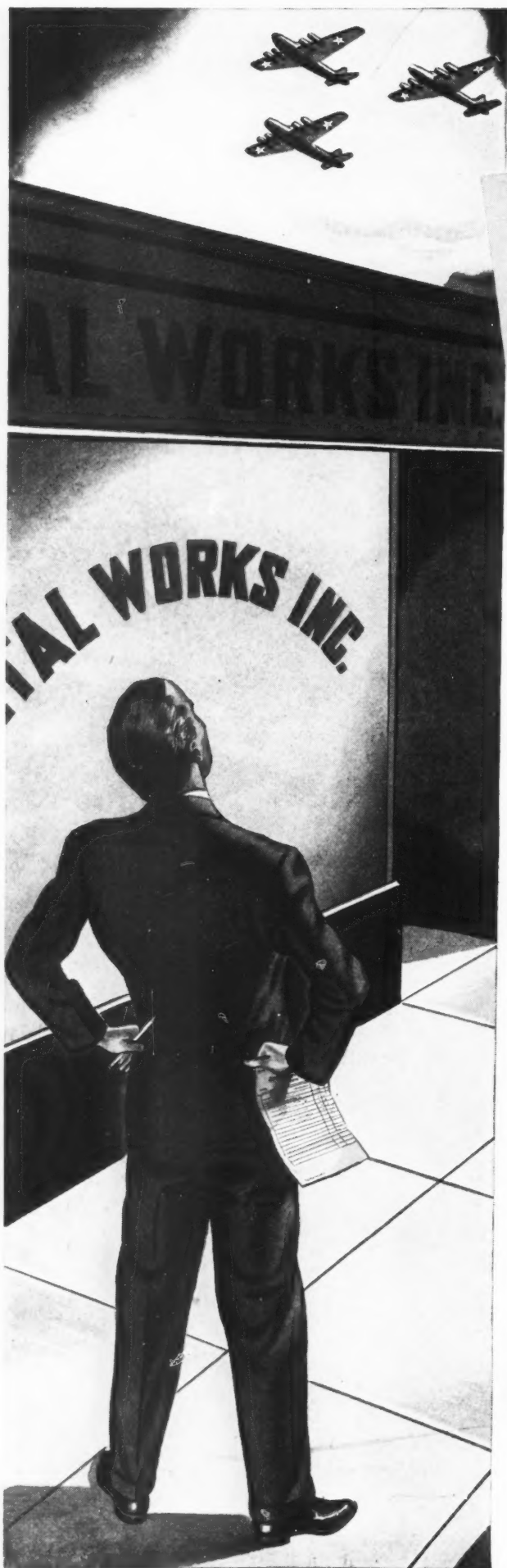


**SERIES DH-70S—Steel Defense Housing Winter Air Conditioner**

615 Miller Street



Ashland, Ohio



**Yours is a great  
contribution to our  
war effort...**

Our war effort needs practically all of the copper that would otherwise go into the familiar materials of your trade... Anaconda Sheet, Roll and Strip Copper. Here's where it is now being used...

About one-third of all copper is needed for ammunition—cartridge cases, rotating bands on shells, time fuses, etc.

Wire and cable for vital electrical conductors in the war industries... in tanks and bombers and battleships... also require a tremendous quantity.

And still more copper is needed for a variety of other uses... in naval and merchant ships of all types... in oil refineries, munitions plants and other places where copper serves best.

So, in doing temporarily without these Anaconda products, you can see how you are helping to make America's war effort strong and forbidding. *And the stronger it becomes, the sooner these materials will once again be available to you.* Our vast production facilities are helping to make your sacrifice as short-lived as possible.



**Anaconda Copper**

THE AMERICAN BRASS COMPANY

General Offices: Waterbury, Connecticut

Subsidiary of Anaconda Copper Mining Company

In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ont.

4233





# ANNOUNCEMENT

We have, for years, made a portion of our HANDY PIPE products of "Terne Plate" for those who preferred lead-coated sheets to galvanized.

Now America's Victory Program has stepped into the picture — and, as all of you know, zinc and spelter are "scarce" metals and are reserved for defense needs.

TODAY TERNE-PLATE HANDY PIPE IS AVAILABLE TO ALL OUR CUSTOMERS — and we guarantee it to be fully as desirable from every angle as our galvanized pipe. The "terne" (or lead) coating protects the steel base fully as long — if not longer! — than the spelter — and there is no checking at crimps and folds. The only difference will be in appearance.

We are very happy at this solution of a problem that was threatening to result in much lost business and much disemployment to furnace contractors from coast to coast.

Our plant is running at top speed — and we are turning out HANDY PIPE AND DUCT WORK of the above material and of tin plate as fast as possible. We solicit your early orders on this basis:

WE WILL FILL ALL ORDERS AS QUICKLY  
AS CIRCUMSTANCES PERMIT.

F. MEYER & BRO. CO.  
PEORIA ILLINOIS

HANDY  
MEYER



F. MEYER & BRO. CO.  
Peoria, Ill.  
Please send your catalog No. \_\_\_\_\_  
with latest discount sheet.  
Name \_\_\_\_\_  
Address \_\_\_\_\_

# To "Keep the Home

## Has Always Been--And Will Always Be --

### Our Prime Objective

True — our facilities and products are contributing to America's VICTORY plans today and "for the duration" — but no "emergency" lasts forever.

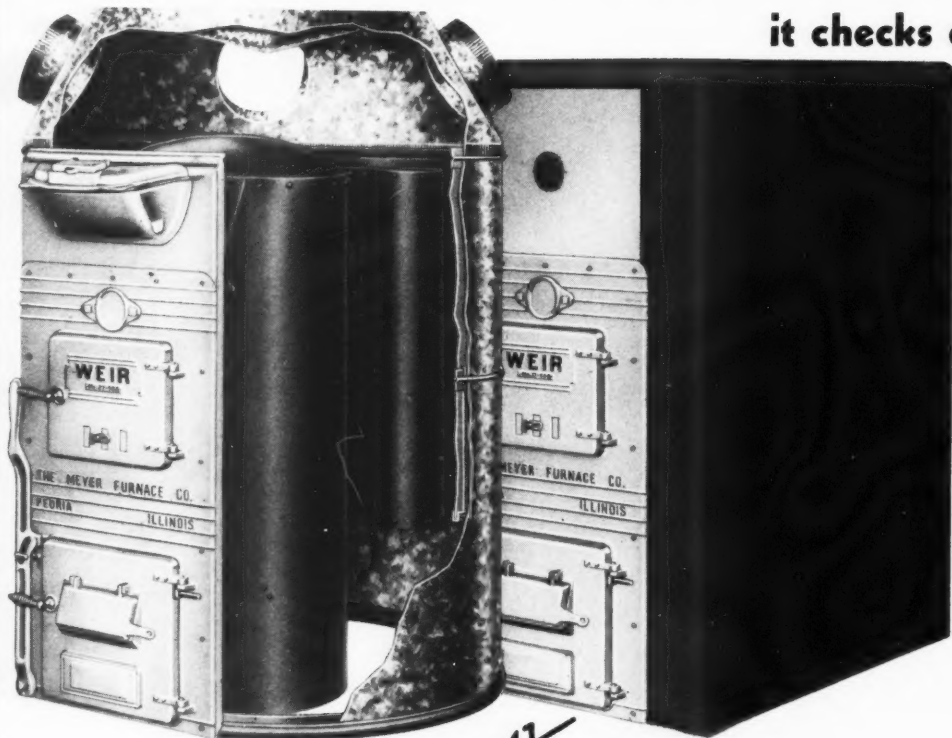
Peace will return and the same courageous, reliant American characteristics that made this the world's greatest nation will also shape the future — and AMERICAN HOMES will be the first consideration.

Heating and air-conditioned comfort will be enjoyed on a scale never before attained anywhere on earth — and this organization will maintain its place in the very forefront of all such developments.

Our assurance to every WEIR-MEYER dealer is that we are already looking beyond today's disturbance. Our past policies remain intact. . . . Our dealers will always be our distribution-and-sales units. . . . Their customers will again be our market . . . AND OUR PRODUCTS WILL BE AS TYPICAL OF THEIR ADVANCED DAY AS THOROUGHLY CAPABLE AND FORWARD-LOOKING RESEARCH CAN MAKE THEM.

## And Here's Our "Home Defender"

**Q Series WEIR -- Designed to meet the needs of the 1942 situation because it checks on these important points:**



1 ✓

#### KNOWN QUALITY

the original STEEL furnace — over a half century on the market. Many 50-year-olds still in use.

2 ✓

#### EXCLUSIVE FEATURES

riveted THROUGHOUT for durability — welded for permanent tightness — perfect-fitting doors — easy-operating grates.

3 ✓

#### EASE OF INSTALLATION

minimum number of "knocked down" parts — pre-fitted to insure "going together" on the job — quickest (you'll say "slickest") casing.

4 ✓

#### PROFITABLE SALES

WEIR-MEYER Dealers MAKE MONEY — and we believe that's what you're in business for.

5 ✓

#### CUSTOMER SATISFACTION

WEIR-MEYER users are satisfied customers, they stay that way, year after year, which means they'll boost YOUR business.



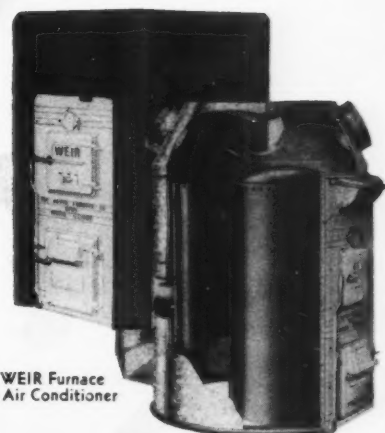
# Fires Burning"



600 Series WEIR Furnace and Air Conditioner

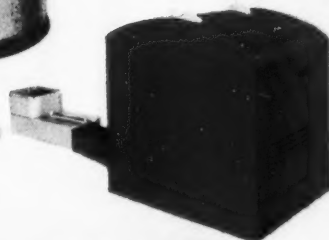


C Series WEIR Furnace and Air Conditioner



T Series WEIR Furnace and Air Conditioner

WEIR Stoker  
18 lb. to 750 lb. Hopper or Bin Feed

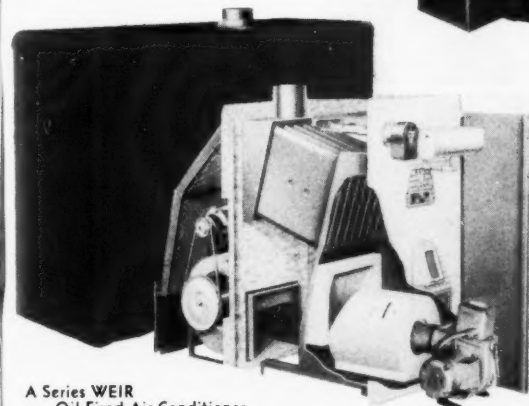


SW Series WEIR  
Stoker Fired Air Conditioner



F Series WEIR  
Gas Fired Air Conditioner

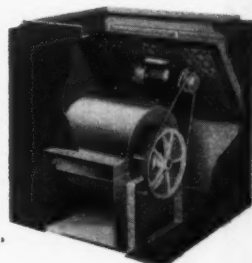
K Series MEYER Gas Fired  
"High Boy" Air Conditioner



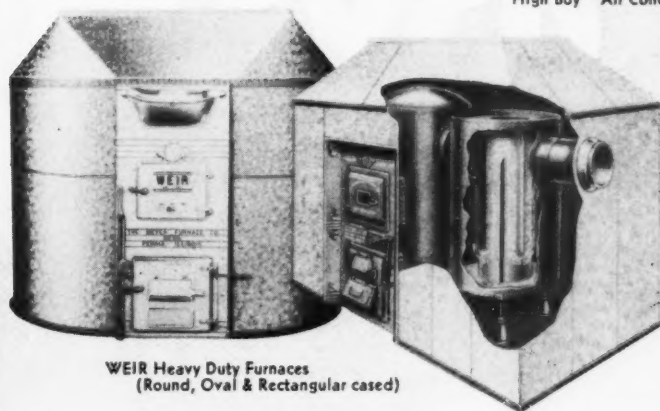
A Series WEIR  
Oil Fired Air Conditioner



MEYER Oil Burner



MEYER "Blo-Aire"



WEIR Heavy Duty Furnaces  
(Round, Oval & Rectangular cased)

## THE MEYER-WEIR *Complete* LINE IS *Still* WITHOUT A PEER!

No other line of warm-air heating equipment can match it! The "samples" shown above are only indicative of our ability to meet the requirements of EVERY heating problem. Whether it is "price", quality, design, eye-appeal, size or type of fuel—WEIR-MEYER has the RIGHT furnace to do the job RIGHT as well as to meet the customer's desires—whether the fuel is to be COAL, GAS OR OIL.

"WHO MAKES IT—MAKES A DIFFERENCE"

## MEYER-WEIR *Exclusive* DEALERSHIPS ARE STILL OPEN — WANT TO "JOIN UP"

We are constantly alert to new dealer connections—and invite those who are also looking beyond 1942 to those days when SALES instead of priorities or allocations, will again be the chief concern of American Business, to learn all about a line that not only has an enviable record in "past performance", but promises to hold its position of superiority and leadership even more distinctly in the future. If you are not altogether satisfied with your present line because somehow it just hasn't got "what it takes", or if you want to sell something really EXCLUSIVE with YOU—and that won't let you down, your first move is to mail the coupon.

**THE MEYER FURNACE COMPANY**  
PEORIA, ILLINOIS

**THE MEYER FURNACE CO., PEORIA, ILL.**

Please send details of the WEIR-MEYER Exclusive dealership

Name \_\_\_\_\_

Address \_\_\_\_\_





# *Our Pledge . . .*

Today we can make but one pledge to the furnace contractors of America:

We pledge that, to the utmost limits within compliance with the requirements of National Defense, we will continue to supply all of the **HANDY FURNACE PIPE AND DUCT WORK** for which we can procure the materials.

We feel sure that, even in a national emergency, the health of those at home is a vital part of the defense mobilization — and that healthfully and comfortably heated homes are necessary to morale and health.

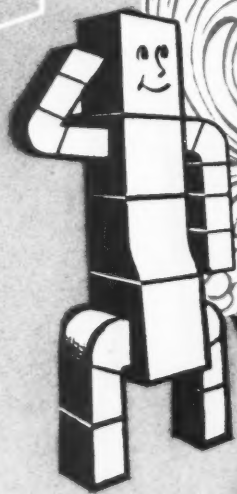
Throughout the years HANDY PIPE has been instrumental in modernized home heating. . . . It has been properly designed and made. . . . And has always been "the yardstick" of the industry.

We are naturally proud of that fact.


The **QUALITY** of Handy Pipe and Duct Work will always be maintained. . . . We may not be able to produce "all you want" — but all that is produced will be worthy of the **HANDY** label.

We beg you to bear with us. . . . We will do **ALL** we can to fill your orders with **QUALITY HANDY PIPE!**

That is our pledge. . . . So send on your orders . . .



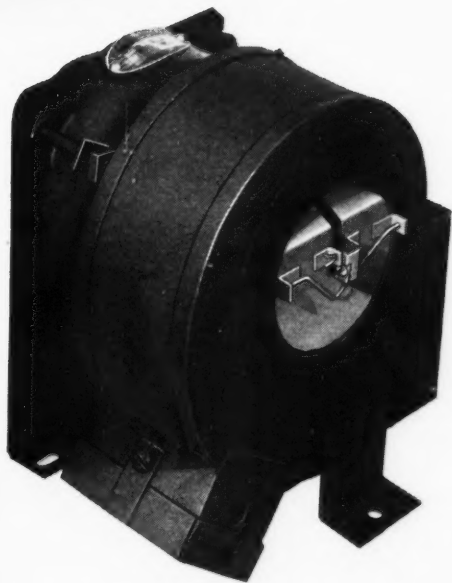
**F. MEYER & BRO. CO.**  
PEORIA ILLINOIS





# FURNACE VAPORIZING BURNERS

*give new possibilities*

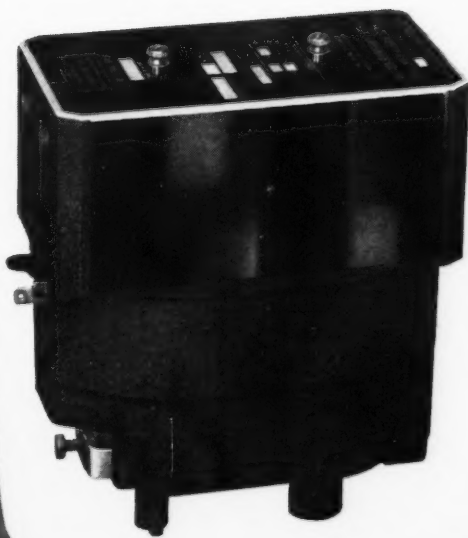


Furnace vaporizing burner units are gaining in popularity because they combine low initial cost and economical operation with satisfactory performance—a result that can now be expected when "Genuine Detroit" oil burner controls are used.

No longer is it necessary to depend on the chimney to produce a draft sufficient for proper combustion. This essential but uncertain factor need cause no concern on jobs that are equipped with "Genuine Detroit" combination air and fuel delivery control units.

It is important information for the dealer to know that the control of air and oil delivery are factory set, the complete unit ready for installation and operation when received from the manufacturer.

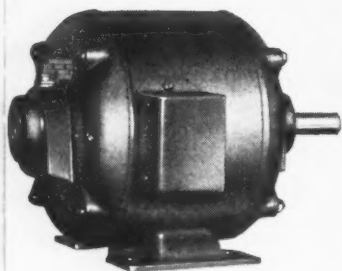
Made to meet the control requirements of vaporizing burners, "Genuine Detroit" furnace controls are available in the various types and combinations demanded by the industry.



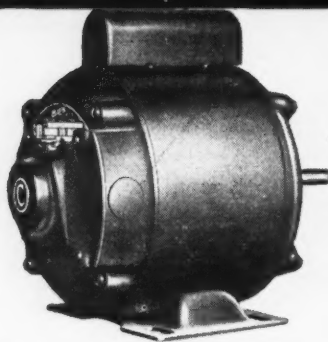
**DETROIT LUBRICATOR COMPANY**  
General Offices: DETROIT, MICHIGAN

Canadian Representatives — RAILWAY AND ENGINEERING SPECIALTIES LIMITED, Montreal, Toronto, Winnipeg

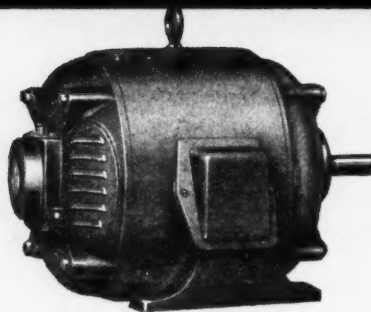




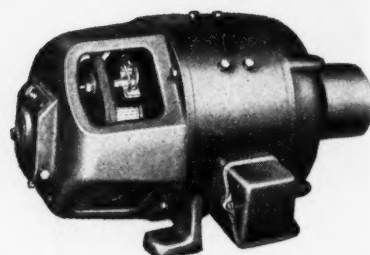
Century Direct Current fractional horsepower motors are available to meet the requirements of direct-current applications.



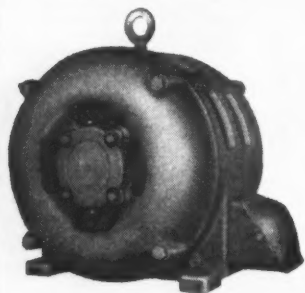
Century Capacitor Start Single-Phase Motors for stokers, blowers, refrigerators, etc.



Century Repulsion Start Induction Brush Lifting Single-Phase Motors for hard-to-start loads.



Century Direct Current integral horsepower motors are available for all direct-current applications.

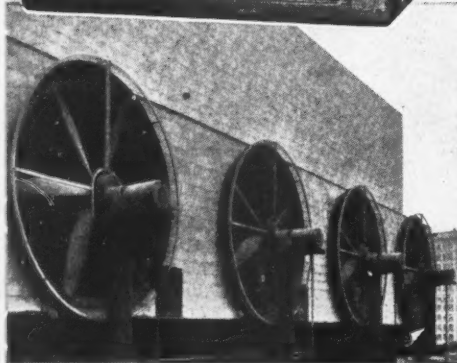
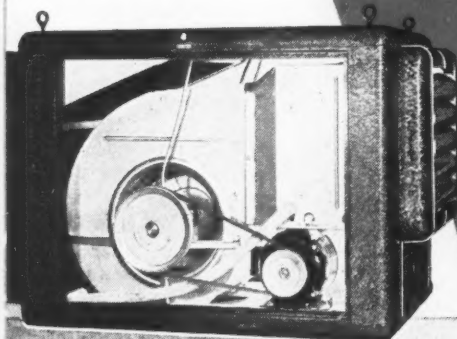


Century Squirrel Cage 3 Phase open-rated motors 150 to 400 horsepower.



Century Squirrel Cage 3 Phase open-rated continuous duty motors.

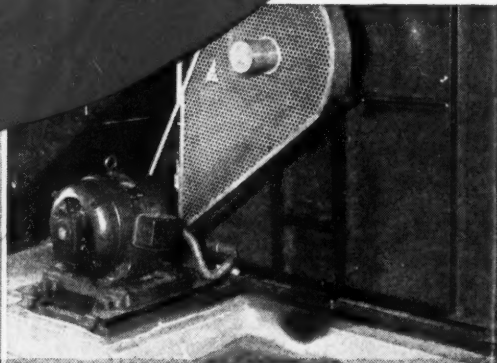
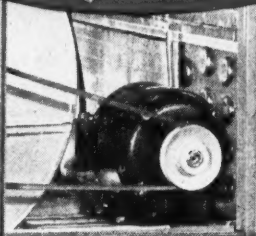
Below) A Century Split phase Motor furnishes the power for this blower.



Four Century Splashproof 3 Phase Motors are protected from rain, snow, sleet, and ice on these cooling tower fans.

# Look to CENTURY MOTORS

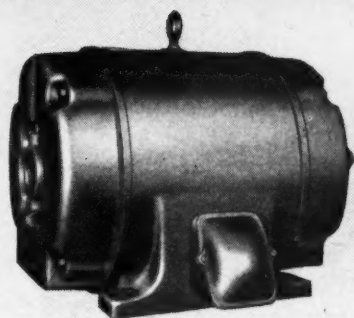
Century 7½ horsepower Squirrel Cage 3 Phase Motor driving a blower.



Century Repulsion Start Induction Brush Lifting Single-Phase Motors are ideal for refrigeration compressors requiring high-starting torque with low-starting current.



egral  
able  
tions.



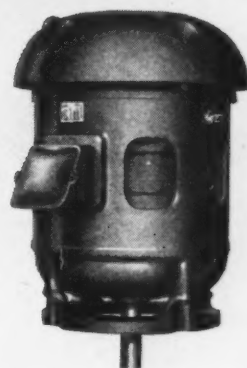
Century Squirrel Cage Splash-proof Motors are protected against splashing or dripping liquids and falling solids.



Century Totally Enclosed Fan Cooled Motors provide protection in atmospheres containing abnormal quantities of current conducting or explosive dusts, abrasives, moisture, or alkalis.

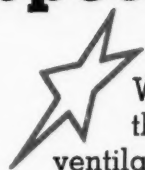


Century Explosion-Proof Motors carry the Underwriters' Label approving installation in atmospheres charged with certain explosive dusts and gases.



Century Vertical Drip-Proof Motor available in various mountings for any vertical mounted application

## For Smooth, Quiet, Dependable Performance That Meets the Specialized Demands of Your Industry



Whatever your motor requirements in the entire field of heating, cooling, and ventilating, Century will help you select the right motor—for domestic, industrial, or commercial applications.

- There are Century Motors with the high starting torque so necessary in starting modern compressors.
- There are Century Motors fully protected against all surrounding atmospheres and adverse operating conditions.
- Century Motors are unusually quiet in starting and running.
- Experienced design, advanced engineering, and rugged construction assures continuous, dependable

operation throughout an exceptionally long life.

Century offers you a most complete line of single phase, polyphase, and direct current motors in a wide range of types and sizes—fractional to 400 horsepower. You can look to Century in full confidence that every Century recommended motor will do much toward assuring peak performance in any installation.

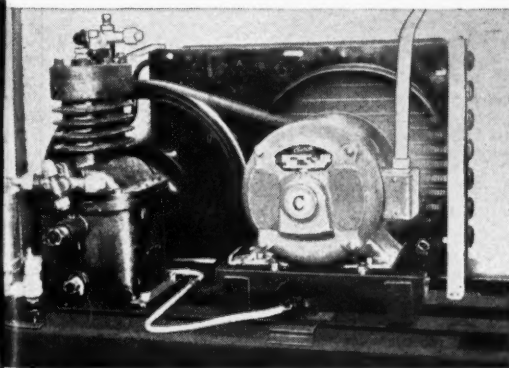
Century Motor Specialists are located in 31 key cities of the country—there's one near you.

### CENTURY ELECTRIC COMPANY

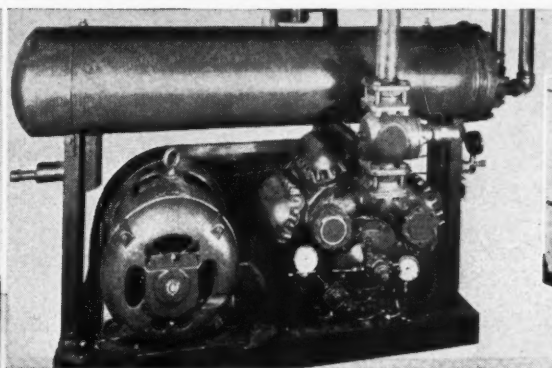
1806 Pine St. St. Louis, Missouri  
Offices and Stock Points in Principal Cities



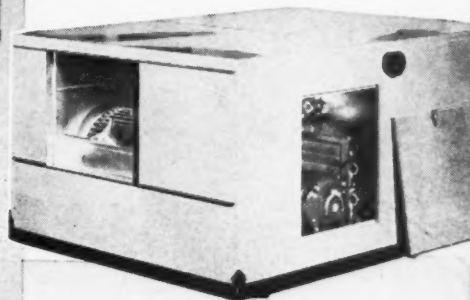
One of the Largest Exclusive Motor and Generator Manufacturers in the World



Century 1 horsepower Repulsion Start Induction Brush Lifting Single-Phase Motor furnishes the power for a self-contained air conditioning unit.



A Century 25 horsepower SCX 3 Phase Motor driving compressor with unloader where low-starting current is a requirement.



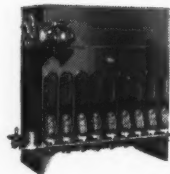
Century 1 horsepower Repulsion Start Induction Brush Lifting Single-Phase Motor driving a room cooler.

Lift-  
refrig-  
erating

# GAS



**\*MUELLER SERIES EPS GAS-FIRED WINTER AIR CONDITIONING FURNACE.** Thrifty comfort for the larger home — and a simple installation for you.



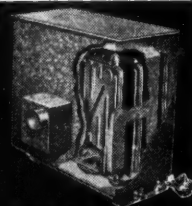
**MUELLER GAS-FIRED UNIT HEATERS.** Open up a new, high-priority field for you, in space heating for factories, warehouses, hangars, shops.



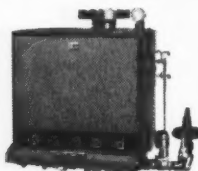
**New MUELLER SEASONSTAT.** All Mueller automatic equipment may now be obtained with this new comfort control which keeps the heating plant in step with the weather — steps it up in colder weather, slows it down in milder weather.



**New MUELLER SERIES CVP ALL-CAST-IRON GAS-FIRED WINTER AIR CONDITIONER.** Small, compact, cabinet type for utility room or basement.



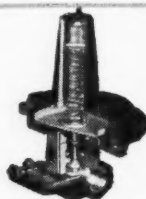
**MUELLER FLOR-AIRE GAS-FIRED FLOOR FURNACE.** Completely self-contained. Also Dual Flor-Aire with wall registers for two adjacent rooms.



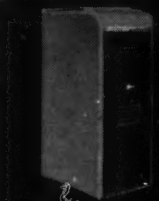
**MUELLER SERIES C GAS ERA BOILER.** Steam, hot water, or vapor heating; direct or indirect hot water supply. For larger residences, apartments, stores, commercial and industrial buildings.



**MUELLER SERIES A AND AE GAS ERA BOILER.** For steam, hot water, or vapor. For residences and small commercial installations.



**MUELLER LEVELIZER.** Gas furnaces indicated by asterisk (\*) available with Mueller's exclusive "Levelizer" — regulates gas flame up and down — not "on and off" to match the weather.

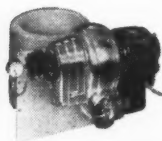


**\*MUELLER SERIES SHP STEEL GAS-FIRED WINTER AIR CONDITIONER.** Attractive, compact cabinet type for utility room or basement.



**New MUELLER SERIES G90 GAS-FIRED GRAVITY FURNACE.** Highly efficient up-draft design. Round or square casing.

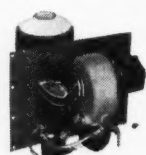
# OIL



**MUELLER PRESSURE ATOMIZING BURNER (patented).** "Spinning" flame burns every drop of oil — gives clean, odorless fire.



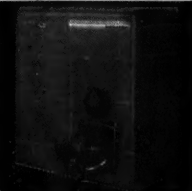
**MUELLER SERIES 50 OIL-FIRED WINTER AIR CONDITIONING FURNACE.** "De luxe economy" in a simplified "Package" unit. In three sizes.



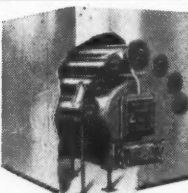
**MUELLER VAPORIZING OIL BURNER.** Air for combustion supplied by mechanical blower. Safety float control.



**New MUELLER SERIES OVP VERTICAL OIL-FIRED WINTER AIR CONDITIONER.** Equipped with Mueller Vaporizing Oil Burner. Burner and controls enclosed.



**New MUELLER SERIES OHP HORIZONTAL OIL-FIRED WINTER AIR CONDITIONER.** Equipped with Mueller Vaporizing Oil Burner. Burner and controls exposed.



**MUELLER HORIZONTAL TUBULAR FURNACE.** For heavy-duty commercial and industrial heating and ventilating. Two types — capacities up to 1,390,000 B.t.u., may be oil fired.



**MUELLER SERIES FB COAL-FIRED WINTER AIR CONDITIONER.** All cast-iron construction. All parts completely enclosed in one cabinet.



**MUELLER SERIES P400 COAL-FIRED WINTER AIR CONDITIONER.** Steel construction. All parts completely enclosed in one cabinet.



**MUELLER SERIES F & G COAL-FIRED CAST-IRON FURNACE.** Known for its unflinching performance. Also "Eterno" Furnace, guaranteed for 20 years.



**MUELLER SERIES 400 COAL-FIRED STEEL FURNACE.** Dependable, economical performance.

# COAL



**MUELLER SERIES SA STOKER-FIRED FURNACE WITH WINTER AIR CONDITIONING.** Extra capacity, no fly ash accumulation, integral clinker chute.



**MUELLER SERIES AP DOUBLE RADIATOR FURNACE WITH WINTER AIR CONDITIONING.** Extra capacity that means quicker response, steadier heat, and fuel saving.



**MUELLER SERIES P200 COAL-FIRED WINTER AIR CONDITIONER.** Uniformly circulates clean, filtered warm air.



**MUELLER SERIES A DOUBLE RADIATOR FURNACE.** Extra prime heating surface holds heat, gives steady operation and economy.



**MUELLER SERIES 200 STEEL FURNACE** with round casing for gravity operation.

★All units in this dark panel are particularly adaptable to low-cost defense houses



*Here's to your success in 1942*  
... with **MUELLER**, the complete  
furnace line that enables you  
to meet changing conditions

To keep busy in 1942 . . .  
concentrate on these three  
classes of work, rated  
"essential" to war effort:

- 1 High-priority defense  
home-building
- 2 Home modernization for  
added dwelling units
- 3 Necessary furnace  
repairs and replace-  
ments

—and look to Mueller for the  
moderately-priced furnaces  
you need for \$6000 "defense  
homes" — as well as mod-  
ernization and replacement.

*I*N WAR OR PEACE — on high-priority defense jobs  
or in the normal market for heating installations — you  
win with Mueller.

Mueller gives you equipment specifically engineered  
and suitably priced for the classes of work that will be  
most active in 1942 — or in any year.

With all our national resources concentrated on win-  
ning a war, you need to concentrate on the kinds of jobs  
that contribute to this effort. Priorities in effect now and  
in the future will tell you what jobs they are — and  
Mueller will gladly help you select the proper equipment  
from the complete Mueller line.

There's no priority on *reputations*, except that which  
you make yourself — through the quality of your crafts-  
manship and the quality of the equipment you install.  
Protect yours — for difficult times which may be ahead  
— by sticking to good-looking, first-quality, nationally-  
known Mueller equipment.

If you need heating equipment for a single defense  
house or a large group of houses—for factory build-  
ings, barracks, airplane hangars, warehouses, etc.  
— for use with any fuel—ask your nearest Mueller  
distributor or write . . . *L. J. Mueller Furnace Co.*  
*2010 W. Oklahoma Avenue, Milwaukee, Wisconsin.*

D-22

**MUELLER**  *Milwaukee*  
HEATING AND AIR CONDITIONING

# SUNBEAM

## WARM-AIR FURNACES AND WINTER AIR CONDITIONERS



**The Mohawk. For Gas.** An entirely new, attractive Winter Air Conditioner. The heating element is made of durable cast iron. Special ribbon type burner utilizes natural, manufactured, mixed or bottled gas. 9 sizes—from 60,000 to 300,000 Btu input per hour.

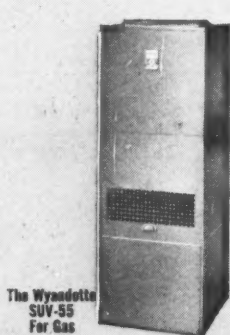
SUNBEAM—the leader in the Warm Air Field, sets the pace for 1942!

The attractive SUNBEAM Line includes new products, new colors, new designs and new styles. It has greater sales appeal than ever before. Heating Contractors, Architects, Builders and Homeowners alike will be quick to grasp this new heating value.

Jackets are finished in a new Placid two-tone Blue with suede texture—a rich combination. Added beauty is achieved by a distinctive name plate finished in ivory and gold.

There are Units of all types, for all homes including small defense homes and for all fuels—automatic or hand-fired. The Mohawk, Allerton (5520-X), Wyandotte (SUV-55) Con-

### A FEW LEADERS FROM THE



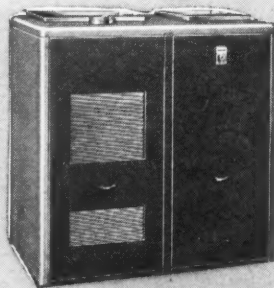
**The Wyandotte  
SUV-55  
For Gas**



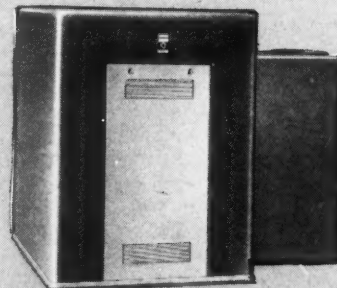
**The Allerton  
5520-X  
for Coal**

#### FOR SMALL DEFENSE HOMES

These new SUNBEAM Winter Air Conditioners are compact, space-saving, low in cost. Can be installed in basement ... or first floor locations such as hall, closet, kitchen.



**FOR SMALL DEFENSE HOMES**  
**The Seneca Winter Air Conditioner. For Gas.** A fine quality, low cost unit with durable steel heating element. 7 sizes.



**The Westmoreland Winter Air Conditioner. For Oil.** Heating element made of heavy gauge boiler plate steel. Available with special Arcoflame Oil Burner as complete Heating Unit. 7 sizes.

The products shown herein are normally available for prompt delivery. Our ability to furnish these, as well as the products shown in our catalogues, is subject to the needs of the National Defense Program.

### HEADQUARTERS FOR



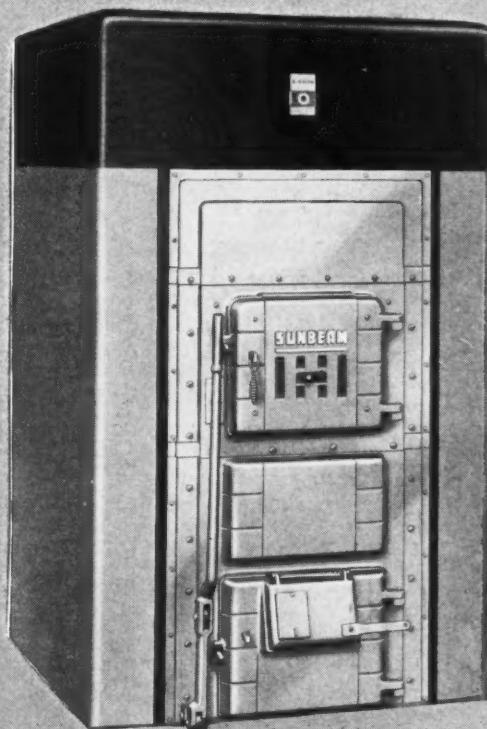
# IN PLACID TWO-TONE BLUE

ditioners and the Arlington "Square" Furnace are the newest products in the line.

Now more than ever before you can make sales easier, speedier and more profitably by selling **SUNBEAM** Warm-Air Furnaces and Winter Air Conditioners. Time Payments are available in accordance with U. S. Government regulations. Write to-day for the name of the **SUNBEAM** Wholesale Distributor nearest you.

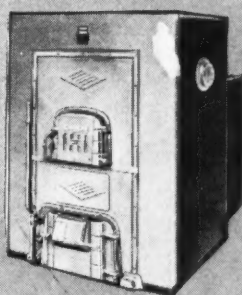
**AMERICAN RADIATOR & Standard Sanitary**  
New York CORPORATION Pittsburgh

**AMERICAN**  
HEATING EQUIPMENT  
COSTS NO MORE THAN OTHERS



The Arlington "Square" Steel Furnace. For Oil or Coal—stoker or hand-fired. Includes construction features of conventional Arlington Furnace. Jacket finished in dark Placid Blue and Black. Special models for gun or rotary type oil burners. 4 sizes.

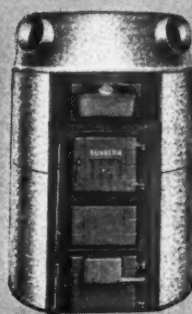
## COMPLETE SUNBEAM LINE



The Longwood Winter Air Conditioner. For Coal. Durable cast iron heating element; ideal for replacing gravity furnace. 3 sizes.



FOR SMALL DEFENSE HOMES  
The Shawnee. A quality Gas Furnace with durable steel heating element. Burns fuel economically. 7 sizes.



FOR SMALL DEFENSE HOMES  
The Arlington. For Oil or Coal—stoker or hand-fired. A modern, efficient steel Furnace. 4 sizes.



FOR SMALL DEFENSE HOMES  
The Kenwood. For Coal. Cast iron heating element, one-piece Radiator and other features. 7 sizes.

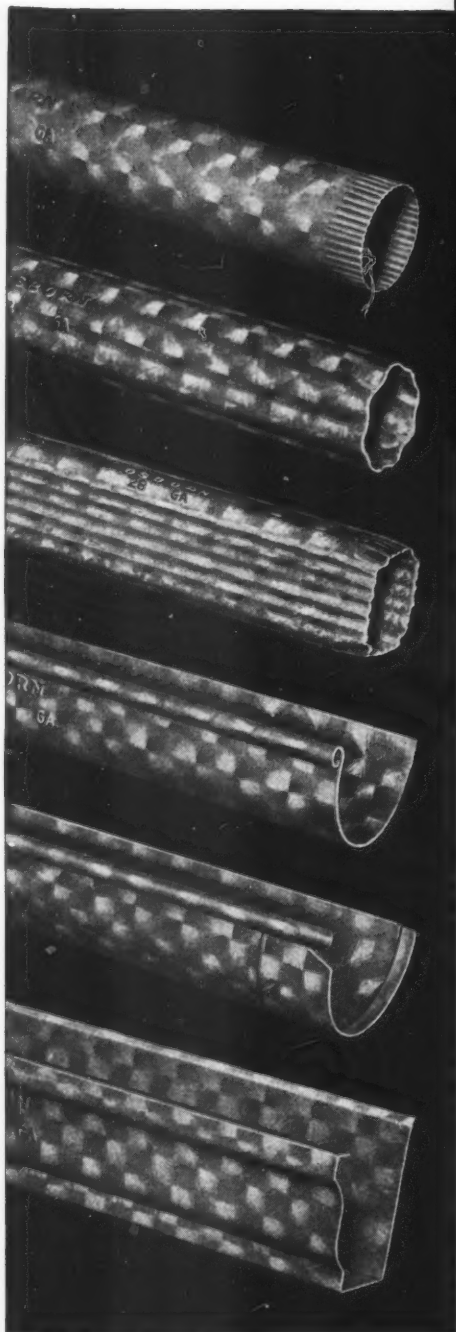


The Distinctive Sunbeam Name Plate—A Badge of Quality

## DEFENSE HOUSING EQUIPMENT

**SUNBEAM**  
WARM-AIR FURNACES AND  
WINTER AIR CONDITIONERS





*In order to speed defense, everyone today is required to fill orders which are accompanied by preference rating certificates ahead of all others. As a result, a high percentage of the steel allocated to OSBORN during the past year was furnished to plants engaged in defense work. Among the products so sold were miles of OSBORN trough and pipe which are now in use on government ordnance plants and arsenals.*



## TROUGH AND CONDUCTOR PIPE *In Army Tanks?*

Many carloads of sheets are required each year to make the eaves trough and gutter, the conductor pipe and smoke pipe, as well as the other OSBORN products which our trade normally uses. But, of course, this is only a handful of material as compared to the millions of tons required by our government to build the tanks, battleships, guns, planes and the many other types of armament needed to win the war in which we are now engaged.

Most of us in the sheet metal industry are obliged, today, to get along with less steel and other materials than is necessary to take care of our available business. But, you and we can be proud of this fact in the knowledge that every pound of metal we do without helps our country in her fight to retain our freedom and security; helps to build more tanks and battleships . . . more guns and planes.

Trough and pipe won't win battles . . . but, steel and self-sacrifice will!

THE J. M. & L. A.  
**OSBORN Co**  
CLEVELAND, OHIO  
BUFFALO • CINCINNATI • DETROIT  
Manufacturers—Distributors of Metals and Metal Products

A DEPENDABLE SOURCE OF SUPPLY FOR 83 YEARS

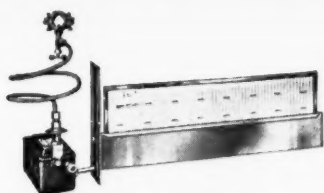


# MAID-O'-MIST

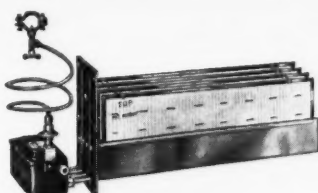
## A COMPLETE AND PROFITABLE LINE OF HUMIDIFIERS AND WATER LINE CONTROL VALVES

**STANDARD EQUIPMENT ON MANY LEADING FURNACES  
HIGHLY EFFICIENT • EASILY INSTALLED • LOW IN COST**

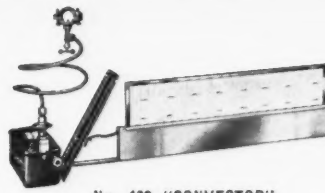
### "CONVECTOR" HUMIDIFIERS FOR WARM AIR FURNACES



No. 181 "CONVECTOR"  
AUTOMATIC HUMIDIFIER



No. 184 "CONVECTOR"  
AUTOMATIC HUMIDIFIER



No. 182 "CONVECTOR"  
AUTOMATIC HUMIDIFIER  
for Sloping Bonnet

Modern in design, efficient in operation, easily installed and moderately priced. Made in 12 sizes in single, double and four trough units to fit either straight or sloping bonnets or hoods. Water feed valve approved by Nat'l Plumbing Laboratory against back-siphoning. Reservoir is located away from the heat of the furnace. Float is fitted with an adjustable arm. Troughs

are only  $\frac{1}{4}$  in. wide. On two and four trough units, the troughs are  $\frac{1}{2}$  in. apart, assuring unrestricted air flow. Equipped with patented, replaceable evaporator pads and front plate brackets for quick removal for cleaning. Can be mounted in the furnace hood or bonnet, or in the plenum. Furnished with 6 ft. of plastic tubing and special design saddle valve.

### PAN TYPE HUMIDIFIERS FOR WARM AIR FURNACES

#### NO. 8856 STEEL PAN HUMIDIFIER AUTOMATIC



No. 8856—"MAID-O'-MIST"  
STEEL PAN HUMIDIFIER

6 ft. of plastic tubing with saddle valve. Equipped with a No. 56 water feeder valve (shown below). Made in 26 and 36 in. lengths.

A highly efficient pan type automatic humidifier, designed for air conditioning furnaces where either high or low bonnet temperatures prevail. Furnished complete with black enameled steel pan, reservoir and removable front hood plate.

#### NO. 58-Z BRONZE PAN HUMIDIFIER AUTOMATIC



No. 58-Z—"MAID-O'-MIST"  
BRONZE PAN HUMIDIFIER

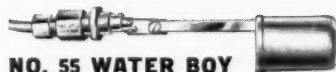
Designed to meet the requirements of the modern, Winter, air conditioning furnace. It serves efficiently on forced circulation furnaces with intermittent firing, due to patented hinged wing construction. The  $3\frac{3}{4} \times 36$  in. pan is a one piece bronze stamping. Fed by No. 59 water feeder (shown below). Water line is easily adjusted by a thumb screw on float valve. Easily installed: Simple to remove for cleaning. Made in 26 and 36 in. lengths. Complete with 6 ft. of plastic tubing with saddle valve.

### AUTOMATIC WATER FEED VALVES FOR HUMIDIFIERS



NO. 50-F WATER BOY  
MIDGET FEEDER

Makes manual bucket or pan type humidifiers completely automatic. Particularly valuable where space is limited. It is only 7 in. long overall and operates in water only 1 in. deep. Simple and easy to install, and provided with adjustment. Made entirely of non-ferrous metals and furnished with saddle valve and plastic tubing.



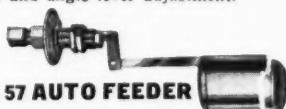
NO. 55 WATER BOY

A simple, positive acting float valve with straight arm. Easily installed by drilling one hole.



NO. 56  
MIDGET FEEDER

Small, yet reliable. Made with self closing valve and angle lever adjustment.



NO. 57 AUTO FEEDER

Equipped with self-closing, removable valve unit with special heat and oil resisting seat. Valve unit can be replaced with ordinary tire valve.

#### NO. 59-F WATER BOY FEED VALVE



This unit converts any hand fed pan into an automatic humidifier. Easily and quickly installed. Non-back siphoning supply valve. Float adjustable for varying water pressures. Furnished either with or without saddle valve and plastic tubing.

#### NO. 8 QUICK HOOK UP SADDLE VALVE

A cleverly designed valve for tapping  $\frac{1}{2}$  or  $\frac{3}{4}$  in. pipe for water supply, and for  $\frac{1}{4}$  in. tubing outlet. The No. 812 saddle valve should be used for plastic tubing.



NO. 85 WATER BOY  
SAFETY FEEDER

A dependable, efficient water line control valve for warm air furnace humidifiers and many other applications. Shell is drawn from non-ferrous metal. Made in six different designs.

Be sure to visit our booth (No. 464)

Due to existing unsettled conditions it may become necessary to make substitutions on some materials.

# MAID-O'-MIST INC.

212 NORTH ARDEN STREET



We will exhibit at the 7th International Heating & Ventilating Exposition, Commercial Museum, Philadelphia, January 26th to 30th, 1942

SELF  
HUMIDITY

# Repair parts

FOR ALL  
HEATING UNITS

IN STOCK FOR IMMEDIATE SHIPMENT  
GUARANTEED TO FIT

**ALSO A COMPLETE STOCK OF**

ASBESTOS PAPER & CEMENTS  
BLOWERS & CONTROLS  
DRAFT REGULATORS  
FIBERGLAS INSULATION  
FILTERS—DUSTOP  
FITTINGS & SUPPLIES  
FURNACE CLEANERS  
HUMIDIFIERS  
REGISTERS  
TANK HEATERS  
TIN FITTINGS

IN FACT WE CARRY EVERYTHING TO  
ENABLE YOU TO MAKE A JOB COMPLETE

**ORDER ALL FROM**

**A. G. BRAUER SUPPLY CO.**

**2100 Washington Ave., St. Louis, Mo.**





# What are you doing about this vast NEW Heating Market?



400,000 defense houses are to be planned and built by private builders under priority by the end of 1942!



420,000 apartments are to be created by converting old-fashioned residences into several living units. A five billion dollar total program!

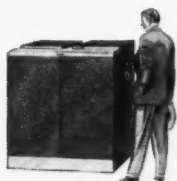
...TURN TO



... for equipment to heat every type of defense home



This G-E Gas Warm Air Unit comes to you completely factory wired and assembled for easy installation. Smallest size occupies only 3½ sq. feet floor space. Three models; ranging from 48,000 to 96,000 Btu output per hour.



Winter Air Conditioners (oil or gas) in several sizes, for small and medium size homes.

You can get efficient, economical heating for every type and size of building in the defense market — when you turn to G-E. Small units, especially, are easily and quickly installed. They save valuable time and labor, and that means more money for you.

And remember this: General Electric heating equipment is priced to meet competition. Get the facts on this profit picture first hand. Send the coupon today!

**GENERAL  ELECTRIC**

GENERAL ELECTRIC CO., Div. 2531, Bloomfield, New Jersey

Please send me details on the G-E Heating Equipment Profit Picture.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ County \_\_\_\_\_ State \_\_\_\_\_



# "Just What Is

- ★ "Can you ship the equipment we have ordered?"
- ★ "Why are some manufacturers able to make reasonably prompt deliveries...others are not?"
- ★ "Why are you taking Defense orders?"
- ★ "What will the market be in 1942?"
- ★ "Will Janitrol heating equipment be suited to meet the requirements of the '42 market?"

SURFACE COMBUSTION CORPORATION...

# The Situation Anyway?

Although no one can, at present, make predictions that will be entirely accurate, we will answer to the best of our ability some of your most pressing questions. Conditions change daily so statements made now will necessarily have to be interpreted in the light of new developments. But there are some certainties with which we can deal, and it is on these that this message is based.

*L.B. Phillips* Vice-President

**Can you ship the Janitrol equipment we have ordered?** We feel we are in as good position to supply our customers as any one else in the heating field making quality products. We are ahead of schedule on FAC units, having shipped in November many of the orders we anticipated shipping in December. We have set up a special department for expediting materials and shipments, our plants are working twenty-four hours a day and every effort is being made to meet increasing demands.

It is our policy first, to take care of orders for defense which have priority ratings, then orders for our old customers who have been responsible for the building of our business. Shipments to new customers will be made when such equipment is available, and after the above demands have been satisfied.

**Why are some manufacturers able to make reasonably prompt deliveries, others are not?**

The sales of some products have not increased materially over the normal demand. Orders for Janitrol equipment have greatly exceeded the general increase in the market. No favoritism is shown in the granting of priorities for steel and other critical materials. Today every manufacturer is affected by these shortages. Therefore the heating manufacturer who is able to make more prompt shipments under these conditions either has excess warehouse stocks or cancellations, or reflects a lesser demand for its products.

**Why are you taking defense orders?** Industry's first job is to help build up America's defense. We would not be doing our part if we neglected or were disinterested in this emergency program. Then, too, defense orders assure a continuous flow of materials into our plants so that production may be maintained and shipments and prices better stabilized.

**What will the market be in 1942?** In many respects the 1942 market will be one of the largest in the history of the heating business. The defense housing program will need approximately 500,000 heating jobs; the FHA conversion program will take between 200,000 and 400,000; industrial plant expansion will require thousands of unit heaters; cantonments, airplane hangars, defense training schools, etc. will all require new heating units which can be quickly installed. There will undoubtedly be enough materials allocated for the manufacture of consumer goods to permit all the production that is likely to be sold during the coming year. There will be a tremendous market for Janitrol equipment in the four important fields—and this equipment is especially adapted to the present day market because it uses less critical materials without reducing the quality of the heating system.

**Will Janitrol equipment be suited to the '42 market?** We are fortunate in having one of the finest research and development departments in the industry. It has been working for months on the design and development of new equipment to meet tomorrow's market needs. No time, effort nor expense has been spared. We will soon announce the new Janitrol equipment which will be available for the new low-cost housing projects in defense areas, cantonments and industrial plant expansion. These units will supplement the already complete line of conditioners, forced air furnaces, boilers, burners and unit heaters—a line that is now unmatched in capacity, design, application and durability. The Janitrol line will permit you to take full advantage of next year's selling conditions.

TOLEDO, OHIO • PRODUCERS OF

**JANITROL**  
Gas Heating Equipment





# VICTORY! IS OUR GOAL★ Use These U.S. REGISTERS For 1942 National Defense and Home Housing Projects

## U. S. No. 40 SERIES GRAVITY BASEBOARD REGISTERS

After One Solid Year have Surpassed all Gravity Baseboard Registers in Excellence and Reception by Heating Contractors.

Nothing like it in Value, Solidity of Construction, Capacity and Function has been offered.

Made in Two Piece Construction with Removable Center, Leak-Proof Flange-Over Feature—No Sealing Necessary.

Get the Best at No Extra Cost.

### *The World's Best* Line of Gravity Baseboard Registers



# U. S. No. 256 AIR CONDITIONING REGISTER



The Four Way Deflection  
ing Projects.

Line with Bendable Vertical  
Grille-Bars for Multi-Flow and  
Lever Operated Horizontal  
Multiple Valves that Control  
Up and Down Air Flow.

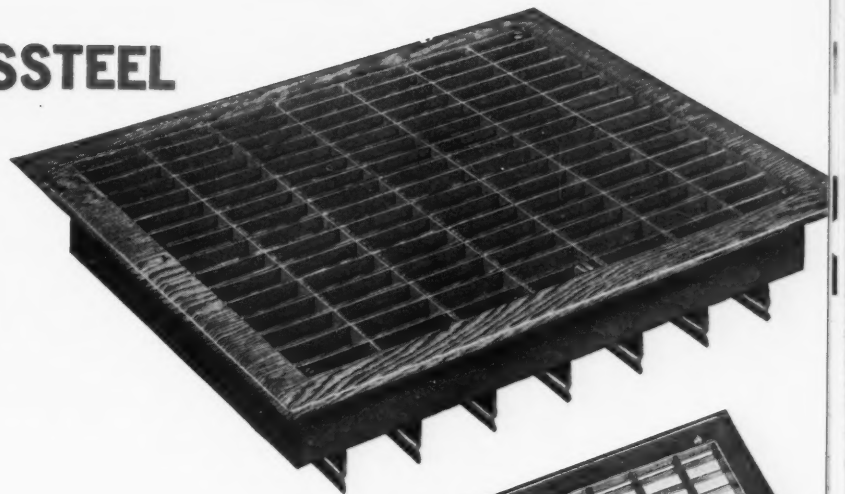
Guaranteed Full Complete  
Grille Coverage by Air Flow  
and Most Perfect Function of  
any Multiple Valve Air Condi-  
tioning Register on the Market  
Today.

Already installed in a Major  
Number of Defense Hous-

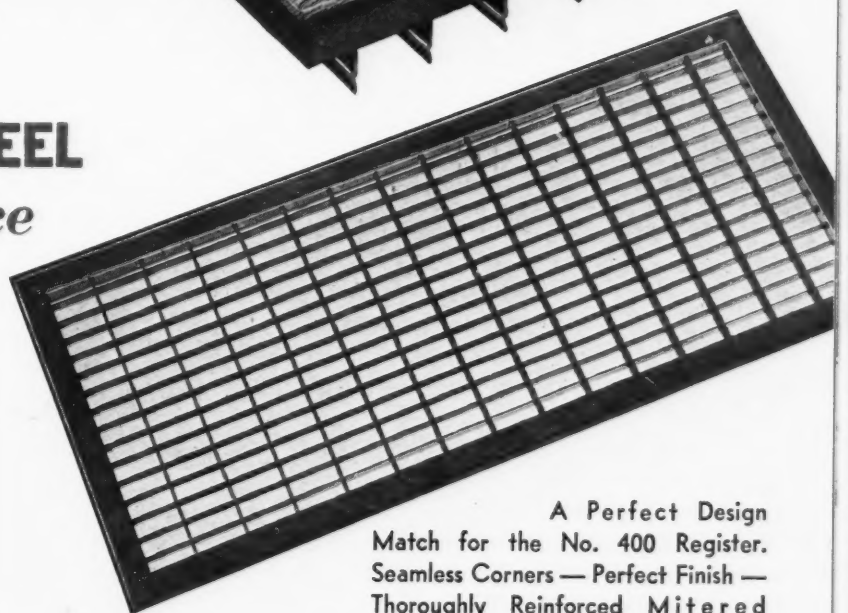
## 1942 Model U. S. TRUSSTEEL FLOOR REGISTER

The New Idea—A Practical One in Floor  
Register Building. Mesh permits Maximum  
Free Area—yet spacing of Grille Bars Pre-  
vents Entrance of Heels.

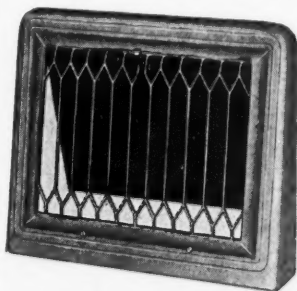
New Feature is — Side Lever Operation  
Valves run Short Way. Result—Easier and  
More Powerful Valve Operation.



## 405 TRUSSTEEL *Cold Air Face*



### PANAMA



The Panama  
Baseboard Regis-  
ter is Still a Great  
Favorite where  
Vertical Bar De-  
sign is Preferred.

A Perfect Design  
Match for the No. 400 Register.  
Seamless Corners — Perfect Finish —  
Thoroughly Reinforced Mitered  
Joints.



Write for Latest Catalog 41G and 41AC which will be effective until March 1, 1942—Request U. S.  
Registers and Grilles from your Preferred Jobber.

# UNITED STATES REGISTER CO.

BATTLE CREEK, MICHIGAN

MINNEAPOLIS • KANSAS CITY • ALBANY • SAN FRANCISCO • NEW YORK, N. Y.

CANADIAN MANUFACTURING DISTRIBUTORS—Canada Register & Grille Co., Toronto, Ontario



# Luxaire

## THE COMPLETE LINE



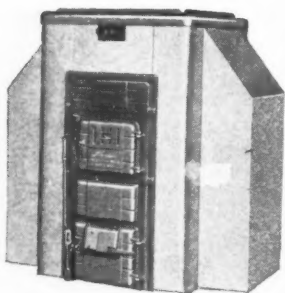
**SERIES 600**  
Coal Burning Hand Fired Furnace  
Available in six (6) sizes

Consolidating many, many years in the manufacturing and merchandising of heating and air conditioning equipment for COAL—GAS—OIL, Luxaire offers you this complete line of fast selling heating equipment of sound design and plenty of lifetime quality built in.

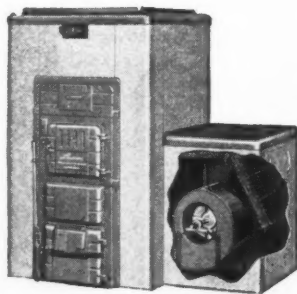
The complete line is of streamline design. Heating elements of all steel leak-proof construction. Cabinets are beautifully finished in two-tone green hammerloid high gloss baked enamel.

A size and model for any type of job, large or small, is ready for prompt shipment.

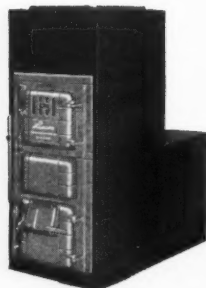
*You are invited to acquaint yourself with this full line.  
Write for further information.*



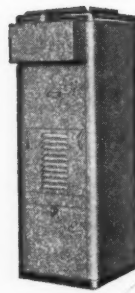
**SERIES 700**  
Coal Burning Hand Fired Gravity Furnace. Available in Stoker model.



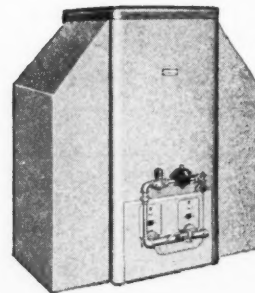
**SERIES AC 700**  
Coal Burning Hand Fired Air Conditioning Unit, available in Stoker models.



**SERIES 720-S**  
Defense Housing Forced Air Furnace—Coal Fired.



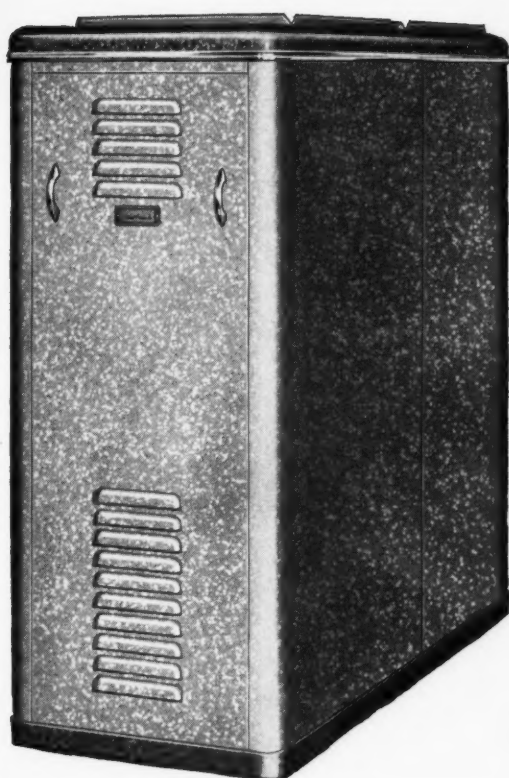
**SERIES H**  
Gas Fired Utility Air Conditioning Unit — where space is important.



**SERIES G**  
Gas Fired Gravity Unit—Economy for the small home.



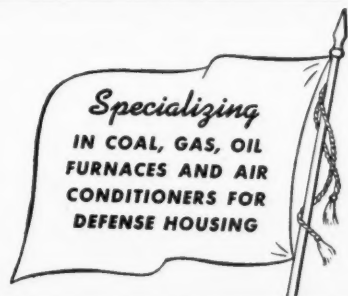
# Warm Air Heating and Air Conditioning Equipment **COAL-GAS-OIL**



**SERIES A**  
Gas Fired Air Conditioning Unit  
Available in four (4) sizes



**SERIES 8000**  
Oil Burning Air Conditioning Unit  
Available in four (4) sizes

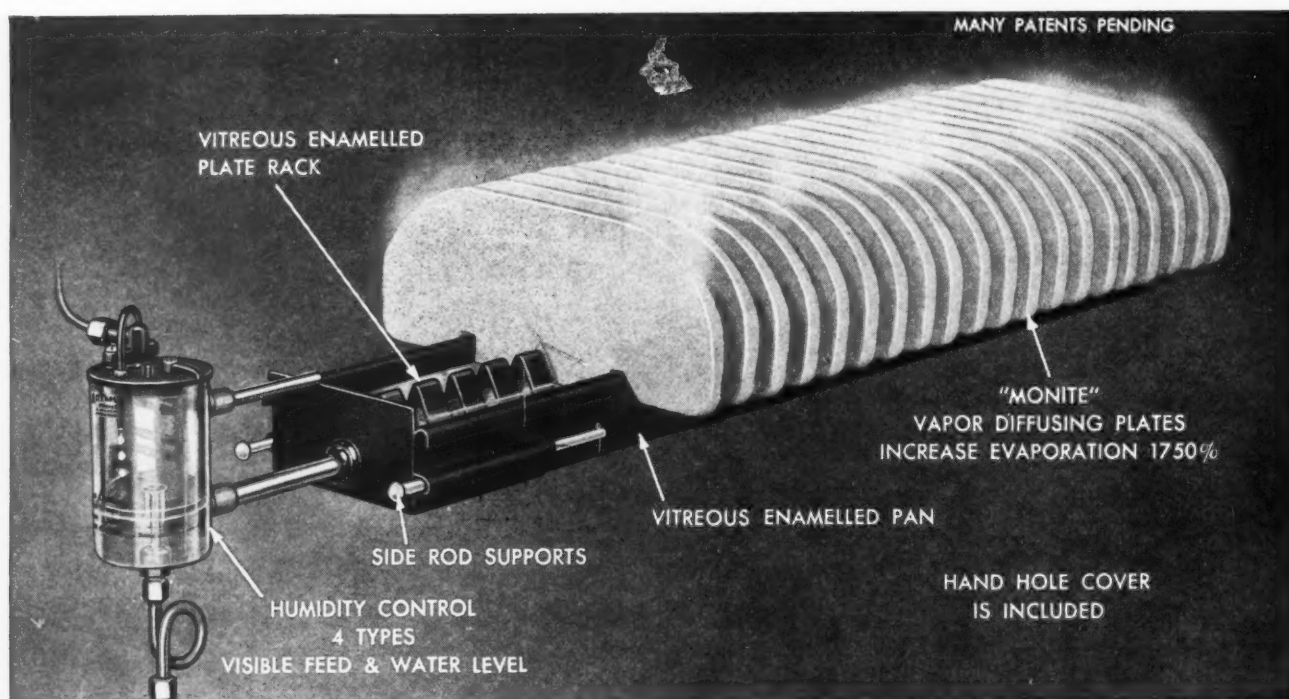


With ALL OUT for defense the watchword of the day, the defense housing program has swung into a new high.

Luxaire engineers have designed a complete line of heating and air conditioning equipment for homes in the defense housing bracket which comply with the specifications set up by the government. Units are ready for prompt shipment.

**THE C. A. OLSEN MANUFACTURING COMPANY, ELYRIA, O.**

# ★ In Humidification



## MONMOUTH IS THE RECOGNIZED LEADER

*Monmouth first to elevate humidification calculations and control from guesswork to a scientific basis.*

*Monmouth first to recognize the necessity for producing porous evaporating plates.*

*Monmouth first to provide an adequately large range of humidifier capacities.*

*Monmouth first to give honest and accurate capacity ratings to its humidifiers, thus eliminating guesswork.*

*Monmouth first to recognize superiority of die molded, non-corrodable plastic material in humidifier controls, and to perfect this application.*

*Monmouth first to perfect and adopt the application of non-corrodable plastic tubing to replace metal tubing.*

*Monmouth first to recognize the importance of providing visible water level and water feed in humidity controls.*

*Monmouth first to perfect and provide sealed-in, non-limeing water feed.*

*Monmouth leads in research on the influence of proper air humidity in conservation of health, property and fuel.*

*Get our free folio, "Adapting Your Business for War Times," with Monmouth Humidification. Write today for your copy.*

**MONMOUTH PRODUCTS CO., 1939 East 61st St. Cleveland, O.**

*The Greatest Name in Humidification*



# Looking Ahead



## WHILE "LAU" WORKS WITH YOU IN A WORLD AT WAR

Lau Blowers and Blower-Filter Units for Army-Navy use, for defense housing, and for "Repair for Defense" jobs, all keep the Lau Blower plant humming as "Lau" works with you in this war effort. Working longer and harder than ever before, we're doing our best to serve you as promptly and efficiently as conditions permit.

You can help us to meet your requirements by anticipating your needs as far in advance as possible, and by furnishing priorities with all your orders.

## THE LAU BLOWER COMPANY PLANS FOR THE WORLD AT PEACE

Looking forward to the day when "peace in our time" is a reality, we at "Lau" are planning for the future. Millions of new civilian homes will be built. More efficient, economical methods of conveying heat in winter, and cool comfort in summer will be found. Our research staff is now developing new products that you may be better prepared to profit in that future market.

Meanwhile, you and we have a job to do . . . to keep the heating plants of American homes in good repair . . . and to supply war needs. Here are sales opportunities for you. Cash in on them by selling Lau Blower Filter Units on FHA "Repair for Defense" jobs.

**THE LAU BLOWER CO. Dayton, Ohio**



**DELUX PACKAGE UNIT FURNACE BLOWER.** Knock down construction. Easily assembled. Low speed, high speed, 3-speed control available at slight extra cost. 16 sizes . . . model for every need.



**LAU BLOWER ASSEMBLIES** Low speed, high delivery. Variable speed drive. Automatic belt tightener device. Automatic cut-out on motor. Rubber cushioned. Available with top, side, and rear motor mountings. 22 sizes.

**LAU BLO-ETTE PACKAGE UNIT.** Shipped assembled to go through any door. Low cost. 8 sizes up to 14".



**NEW 400 SERIES BLO-ETTE.** The lowest priced blower in all Lau Blo-ette history. Made to sell owners of 3 and 6 room dwellings. Easy to install. Shipped assembled . . . goes through any door. Two-speed control available at slight extra cost.



**LAU BLOWER WHEEL.** Squirrel cage, forward curve, multi-blade type wheels. Double inlet, double width. All die formed parts. Dynamically balanced. Guaranteed true and without vibrations at operating speeds.



**LAU PILLOW BLOCKS** . . . positive self-aligning. Light weight, durable. Housing die formed from heavy wrought steel. Dures Bronze bearing lubricated through pores by capillary action.



**LAU NITRAIR FAN.** Three blade Fan. Venturi-Type entrance housing. Self-aligning bearings. Rubber mounting on quiet motor. Wood and fibre board vent box.



**LAU NITRAIR ROOM COOLER.** Low cost, light weight, silent attractive portable panel-type fan with grille adjustable with down-panel. Wiring for plug connection.



**We are proud to announce the continuation  
of our unique policy of supplying Gas and Oil  
Fired Winter Air Conditioning Equipment to  
manufacturers exclusively. We invite inquiries.**

**MAYFLOWER AIR CONDITIONERS, INC.**  
**Saint Paul, Minnesota**









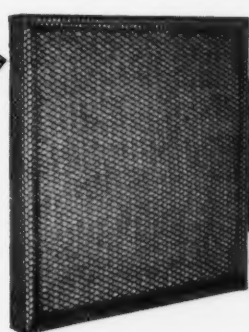
# LOOK AT Tampico!



This is the exclusive Tampico Fibre that does such a remarkable filtering job.



This is the exclusive Tampico Metal "air free" Frame that provides the sensational Tampico ruggedness.



This is the Underwriter's Label that means that Tampico has earned the rating of flame-proof!

The closer you inspect a Tampico the more you realize that it's a *better* filter! Its ability to withstand repeated tappings in the hands of your customers means longer life and greater customer satisfaction. And flame-proof characteristics mean that you'll sell it with greater assurance—with less sales effort—with no price cutting.

We invite you to "look at Tampico" at our expense by sending the coupon for your free sample. We believe that you too will join

the hundreds of Dealers everywhere who are "switching to Tampico" as the outstanding filter "buy"! **Chicago Filter Company, Joliet, Illinois.**

-----Send for Your Free Sample!-----

Chicago Filter Co.,  
Joliet, Ill.

Gentlemen: If Tampico IS the best filter for my customers, I'd like to know about it. Without obligation on my part, I'd like to receive a free sample.

Name .....

Firm Name .....

Address .....

City ..... State .....

## TAMPICO FILTERS

"The World's Largest Exclusive Air Filter Manufacturers"

# DECIDE NOW TO SAVE

## ★ TWO WAYS FOR DEFENSE!

★ *Fuel conservation is essential—* and a White-Rodgers Night Set-Back system in combination with other White-Rodgers Heating Controls will assure maximum fuel savings for every installation.

Separation of thermostat and timing mechanism\* plus the rapid response of Hydraulic-Action Controls to temperature change make these savings possible with any type of fuel or heating system.

★ *You'll save man-hours too—* because White-Rodgers clearly calibrated dials plus convenient knockouts and simplified wiring and mounting facilities result in neat, speedy installations. Time saved can be profitably spent on new prospects.

Find out what White-Rodgers Controls can do for your business by writing today for your copy of the White-Rodgers Heating Control Catalog.

\*Heat of timing motor cannot affect accuracy of the thermostat.



TYPE 2402 (at left)  
Time Switch with slow-speed synchronous motor. Sealed-in lifetime lubrication. Built for a lifetime of trouble-free service.

TYPE 134 (above)  
Heat-Anticipating Thermostat for night set-back temperature control. Switch permits continuation of day temperature beyond usual time, when desired.



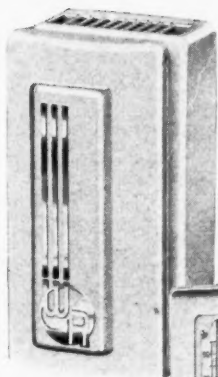
TYPE 519  
Combination Fan and Limit Control for warm air service. Incorporates two individual Hydraulic-Action Controls in a single case. Two-speed fan controls also available.



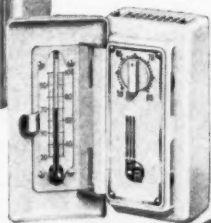
# WHITE ★ RODGERS ELECTRIC CO ★

1215a Cass Ave. ★ St. Louis, Mo.

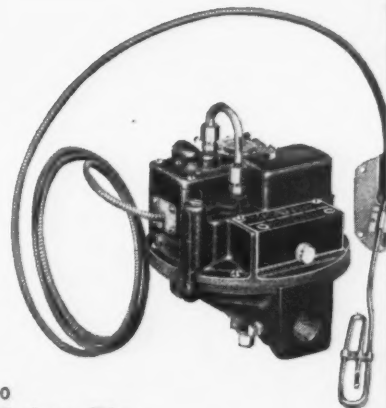
Controls for Heating ★ Air Conditioning ★ Air Pollution



**TYPE 120**  
Heat Anticipating  
Thermostat. Attractive  
hinged cover  
conceals thermom-  
eter and Touch  
Temperature Ad-  
justor. Improved  
bimetallic element.



**SERIES 150**  
Heavy Duty Line  
Voltage Room Ther-  
mostat—uniformly  
calibrated dial—no  
relay necessary on  
most installations—  
can handle up to 10  
unit heaters.



**TYPE 2650**  
White-Rodgers Dia-  
phragm Gas Valve  
and built-in Hydraul-  
ic-Action mechanical  
limit control, com-  
bined into one easy-  
to-install unit.



**TYPE 2504**  
White-Rodgers Sole-  
noid Gas Valve. High  
plunger torque—no  
hum. Types for line  
or low voltage. Man-  
ual opening feature  
optional.



**TYPE 726**  
Night Set-Back  
Stoker Timer with  
dependable slow-  
speed motor plus  
fused line switch  
and magnetic relay.  
Built for years of  
accurate service.



**SERIES 400**  
Hydraulic - Action  
Warm Air Limit Con-  
trols provide complete  
protection against  
overheating—no tem-  
perature drift. Flush  
mounting.



**TYPE 1117**  
Dual Immersion  
Circulator-Limit  
Control. Both Hy-  
draulic-Action Ele-  
ments in a single  
vertical or horizontal  
well. Single immer-  
sion types are also  
available.



**TYPE 1102**  
Surface Hot Water  
Limit Control. Hy-  
draulic-Action Ele-  
ment provides over  
20 inches of contact  
with hot water riser  
for quick response.



**SERIES 1200**  
Steam Limit Con-  
trols—Easy-to-read  
calibrated dials  
with screw-driver  
adjustment.

## THE DOUBLE-SAVING CONTROLS WE NEED NOW!

Look over this representative group of White-Rodgers Heating Controls today and select the ones needed for your next installation. Their beauty and neat appearance will appeal to your customers — and you'll learn what fuel and time conservation really means by specifying White-Rodgers Controls.



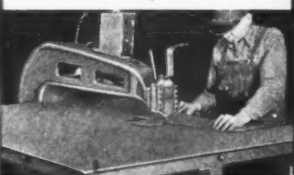
**JOBS LIKE THESE  
ARE HANDLED BEST  
WITH UNISHEARS**



**CUTTING SECTION FROM  
STAINLESS steel sink, No. 16**  
Unishear follows straight and  
curved lines, cuts fast and  
clean, with no distortion of  
metal and no waste.



**CONTINUOUS PRODUCTION**  
in 12 gauge hot rolled steel  
is this 144A Unishear's job.  
It's built to handle continuous  
production or prefabrication  
of sheet metal products.



**NO STARTING HOLE NECES-  
SARY FOR INSIDE CUTS.**  
This plant's Stationary "O"  
type Unishear cuts cost and  
time required for setting up  
heavy machines and making  
trimming dies. Cuts curves  
down to  $\frac{1}{4}$ " radius.

# Only **STANLEY** Builds The **UNISHEAR**



**EASIER TO HANDLE THAN SNIPS** and does smoother, cleaner  
work. Cuts 18 gauge hot rolled steel . . . any pattern. The  
pivoted handle provides a comfortable grip for using the  
"Mighty Midget" Unishear in any position. Ask for a demon-  
stration, or write for literature. Stanley Electric Tool Division,  
The Stanley Works, New Britain, Connecticut.

# STANLEY



# ELECTRIC TOOLS

*A Complete Line For Industry — "Cost Less Per Year"*



"Mighty Midget"  
Capacity 18 ga.  
hot rolled steel.



No. 16 Portable.  
Capacity 16 ga.  
hot rolled steel.



No. 144A Portable.  
Capacity 12 ga. hot  
rolled steel.



"A" Model Stationary.  
Capacities 14 and 10  
ga. hot rolled steel.



"O" Model Station-  
ary. Capacity 14  
ga. hot rolled steel.



"B" Model Station-  
ary. Capacity up to  
 $\frac{1}{4}$ " boiler plate.

# Triple Filter Life-Stop Waste with this Amazing New "RiP-CLEAN" AIR FILTER

*Now You Can Give  
Real Economical and  
Profitable Filter Service*

Here it is at last! The filter which needs no washing . . . which lasts longer . . . which cuts the costs of clean air by 65% . . . the new triple-life RiP-Clean Air Filter!

You make more money with RiP-Clean filters, for they serve your customers better. In extended field and laboratory tests, RiP-Clean Filters actually triple dust holding capacity, maintaining 93% dust removal efficiency. When air restriction due to lint, dirt and dust becomes great enough to hamper air flow, the user, instead of attempting to clean the filter, simply rips off two top layers. This removes the surface dirt and lint without destroying the high filtering efficiency. This process can be repeated, tripling the useful life of the filter and thus decreasing filtration cost to  $\frac{1}{3}$ .

*Write for Full Details!*

Learn how YOU can have the extra profits from this amazing new filter. For full details, write Research Products Corp., Madison, Wis.



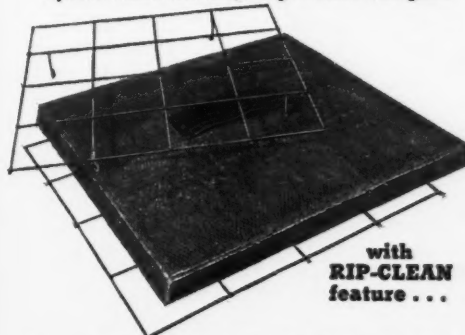
## RESEARCH AIR FILTERS

RESEARCH PRODUCTS CORP.  
MADISON, WISCONSIN



### No. 200 Series RE-FIL-ABLE TYPE with RiP-Clean Construction

The "200" Series Research Air Filter holds the filter pad between two wire grids which hook together. When the filter is dirty, the top grid is unhooked, two layers are torn off as shown above. Snap top grid back into position and place filter back in the furnace or air conditioning unit. After this process is repeated 5 times, the remaining filter pad is replaced with a new one, using the same wire grids.



Research RiP-Clean Filters contain almost no critical materials. They waste none of Uncle Sam's precious metal . . . and there's no expensive frame to salvage. No. 200 Series Re-Fil-Able Type has wire grids which are used over and over again.

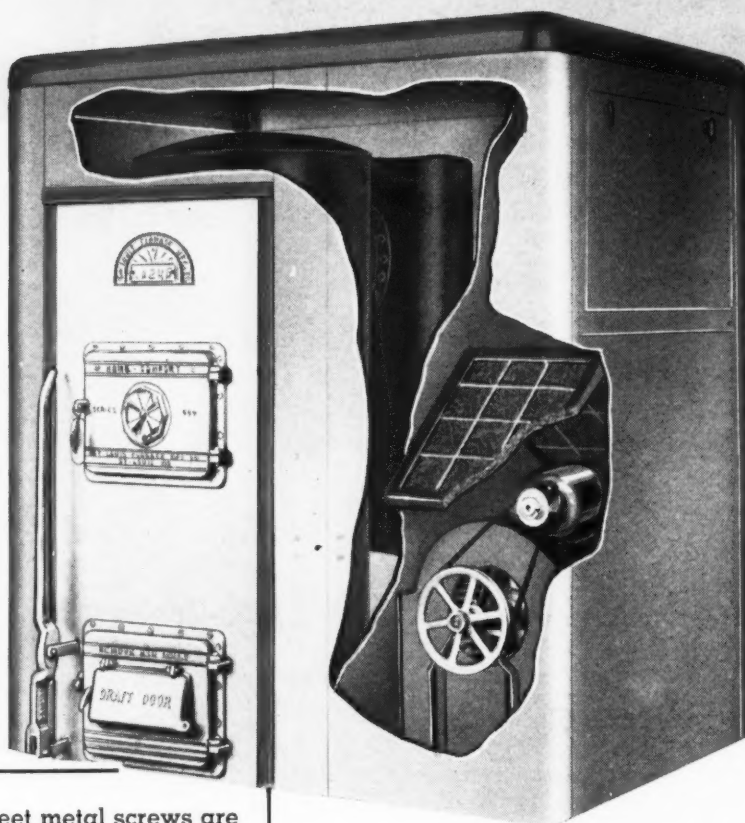


## ★ SAVE FOR VICTORY ★

Save Time — Save Material — Save Fuel

WITH

## "HOME COMFORT" SOLARAIRE



In war or business you must take the initiative. With "Home Comfort" you have an abundance of selling features that will keep you on the firing line . . . sales ammunition that will make your prospects sign on the dotted line. There is no "black-out" of profits for "Home Comfort" dealers.

*Coal-  
Oil-  
Gas-*

No nuts, bolts, or sheet metal screws are used in casing-up the 500 Series. You save an hour's time on every installation. It has the "Eye Appeal" that closes sales . . . and the performance that makes satisfied customers.

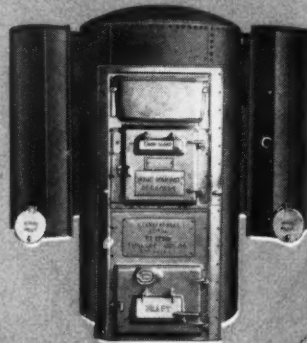
Write today for our dealer proposition and price list. Feature the "Home Comfort" Line—and you'll make more sales—easier, quicker, more profitable.

**ST. LOUIS FURNACE MFG. CO.**  
2901-11 Elliot Ave. St. Louis, Mo.

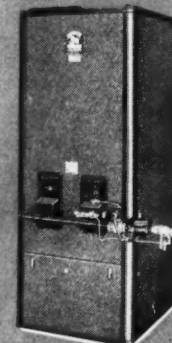
**CONTROLAIRE Series, Oil-**  
fired 85,000 to 240,000 BTU.



**SOLARAIRE Series, Coal-**  
fired 50,000 to 450,000 BTU.



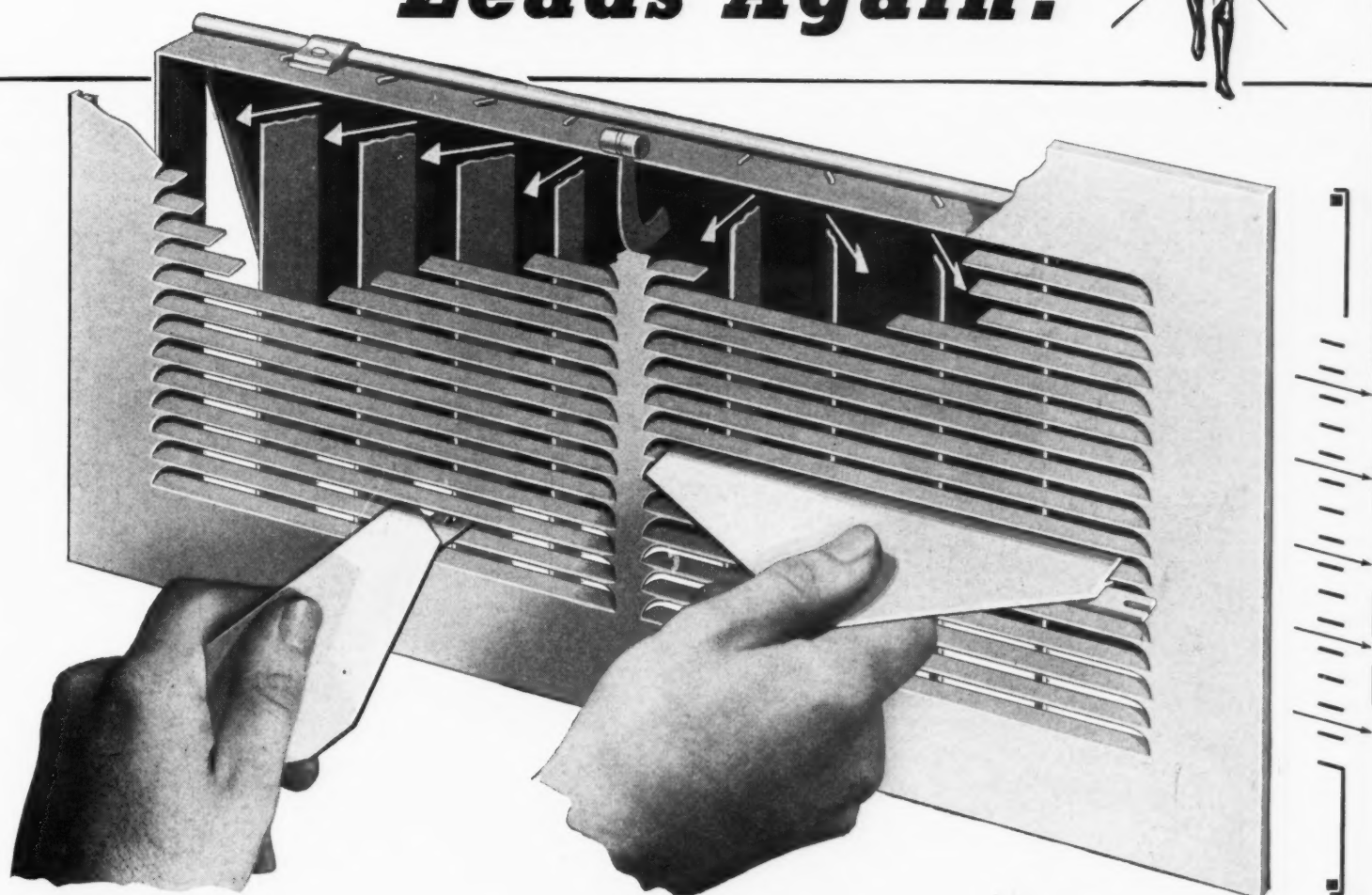
**SUPERAIR Series, Gas-fired**  
55,000 to 220,000 BTU.





# INDEPENDENT

## *Leads Again!*



## **No. 439 Sets the Pace in Anticipating DEFENSE HOUSING NEEDS!**

Horizontal grille bars, formed in the wrought steel face, are set to deflect air flow about 15 degrees downward. Being flexible, they may be bent, before or after installing, to direct the air flow to any other angle upward or downward, or straight outward.

Vertical deflecting vanes attached to the back of the register face direct the air flow straight outward in the center, 30 degrees right and 30 degrees left — the arrangement required for most installations.

These deflecting vanes also are flexible and may be set to direct the air flow all right, all left, or any combination of directions.

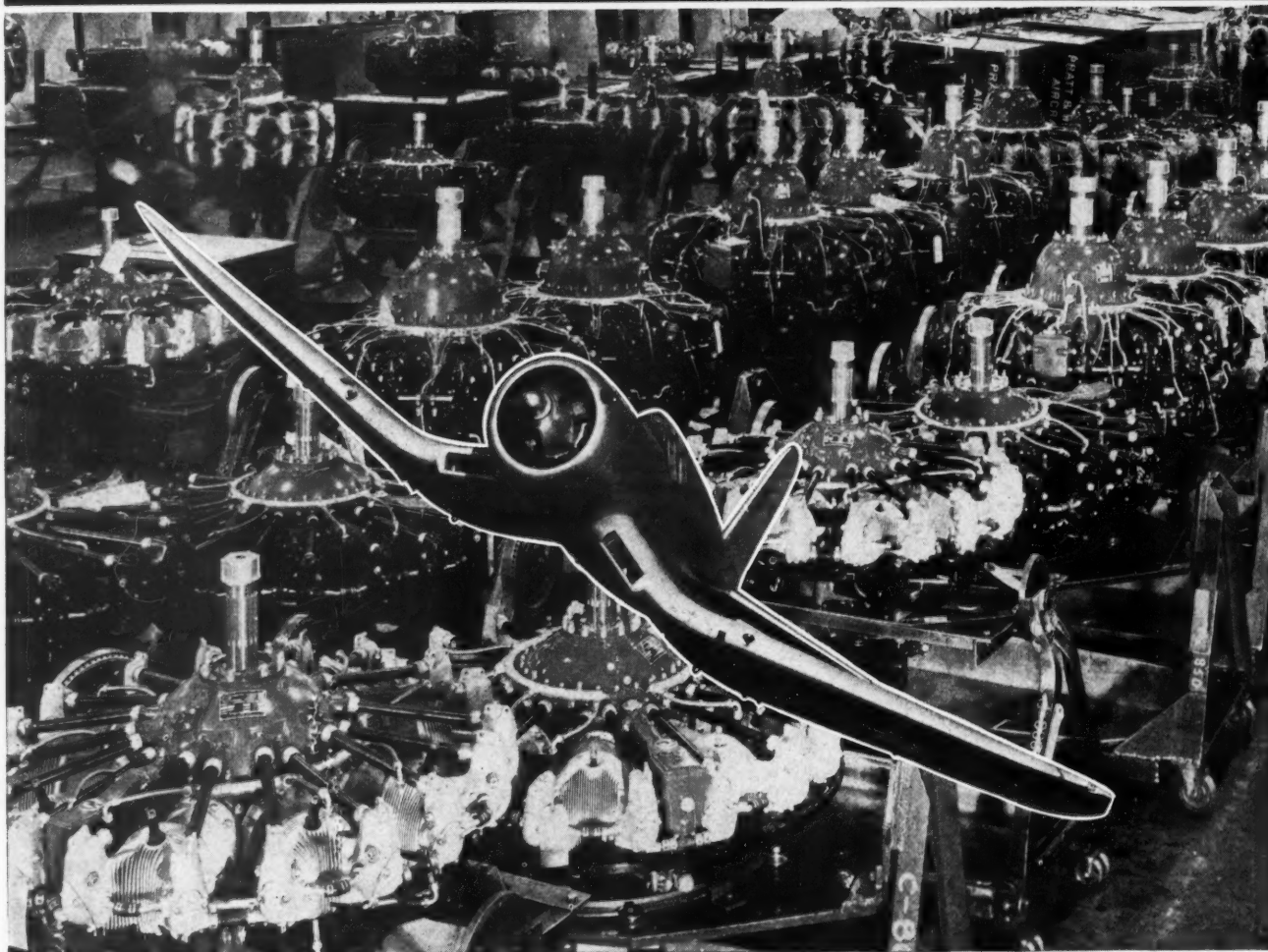
Grille bars and deflecting vanes are easily adjusted with tool accompanying each shipment.

★ Requirements specified by Government engineers for air conditioning registers for defense houses were found to have been already fully incorporated in Independent Register No. 439. Note that it provides every desirable quality: Affords widest latitude in deflecting air flows four ways . . . Valve opens complete 90 degrees to admit full flow of air from horizontal air duct . . . Simple, modern design conserves material and presents handsome appearance . . . And equally important, it is moderately priced to give big value. Made in sizes to meet all standard requirements. Send for catalog.

### **The Independent Register Co.**

3747 East 93rd Street • Cleveland, Ohio

## Where trustworthy tools are vital



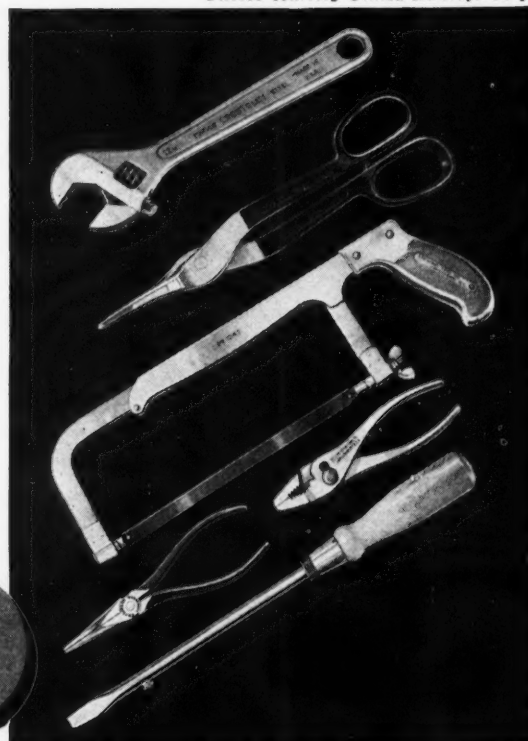
*Photos courtesy United Aircraft Corp.*

In very few fields is precision so vital as in the aircraft and allied industries. In the manufacture of aeroplane engines, trustworthy tools are indispensable — the slightest error in adjustment may spell the difference between life and death in the air. In the multitude of arsenals that dot the country, you'll find our skilled mechanics and craftsmen relying on Crescent Tools to do a good job and do it fast.

Crescent Tools include adjustable wrenches, pliers of all types, hacksaws, snips, screwdrivers, etc., etc. They are sold under the "Crescent" and "Crestoloy" trade names by hardware dealers and industrial distributors everywhere.

CRESCENT TOOL COMPANY, JAMESTOWN, N. Y.

**YOU CAN ALWAYS DEPEND ON  
CRESCENT TOOLS**

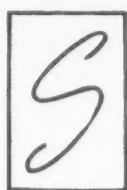






# SARAN<sup>\*</sup> *Tubing*

AN ALTERNATE FOR COPPER, NICKEL AND STAINLESS STEEL TUBING



*Saran* plastic is now being fabricated into a flexible semi-transparent tubing by the Skuttle Sales Company. Like the base material, this tubing is very tough and possesses outstanding chemical resistance. Because of these properties Saran Tubing has already displaced strategic materials such as copper, nickel, stainless steel and ceramics in industries where this type of tubing can be used to advantage.

Saran Tubing is available in sizes from  $\frac{1}{8}$ " to  $\frac{3}{8}$ " O.D. with various wall thicknesses of .030" to .062" and may be joined by Parker Standard Tube Couplings S.A.E. and other flare type fittings.

Space does not permit the listing of the many uses of Saran Tubing, but a letter will bring you complete data on this popular tubing. Samples can also be supplied for testing operations.

\*Trade Mark registered by Dow Chemical Company.



SKUTTLE *Sales* COMPANY  
*Air-Conditioning Equipment*



# SKUTTLE

SKUTTLE SERIES 300 AUTOMATIC HUMIDIFIER WITH VAPOGLAS PLATES

**S** *skuttle* —the name that represents the longest experience in the development and manufacture of automatic humidifiers. It is a name that is associated with quality. It is a name that jobbers and dealers have long recognized as a profit builder in their line of furnace accessories.

In close cooperation with our nation's armament program, Skuttle will use alternate materials in the manufacture of its products where necessary. However, none will be incorporated until fully tested and approved by its Engineering Department. By adhering to this policy our customers and friends may continue to expect and obtain quality products from Skuttle.

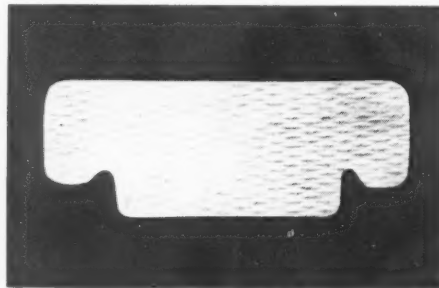
## *Vapoglas* EVAPORATING PLATES

Skuttle's all-glass evaporating plates are a revolutionary idea in the humidification field.

Made of pure glass by a special process, these VAPOGLAS® units hold almost 50% more water per pound than the ordinary brick ceramics. Yet are 60% thinner than the old type ceramics so that there is less resistance to air flow across them. Sizes available for 3" and 7" wide pans.

Dealers and Jobbers will find a ready market for VAPOGLAS plates in the home owners present humidifiers.

Free samples of VAPOGLAS can be supplied by your distributor.



*Skuttle does not anticipate glass to be a strategic material and will be able to supply VAPOGLAS during the emergency*

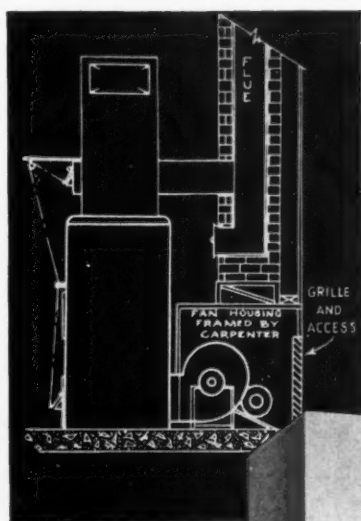


SKUTTLE *Gales* COMPANY  
Air-Conditioning Equipment

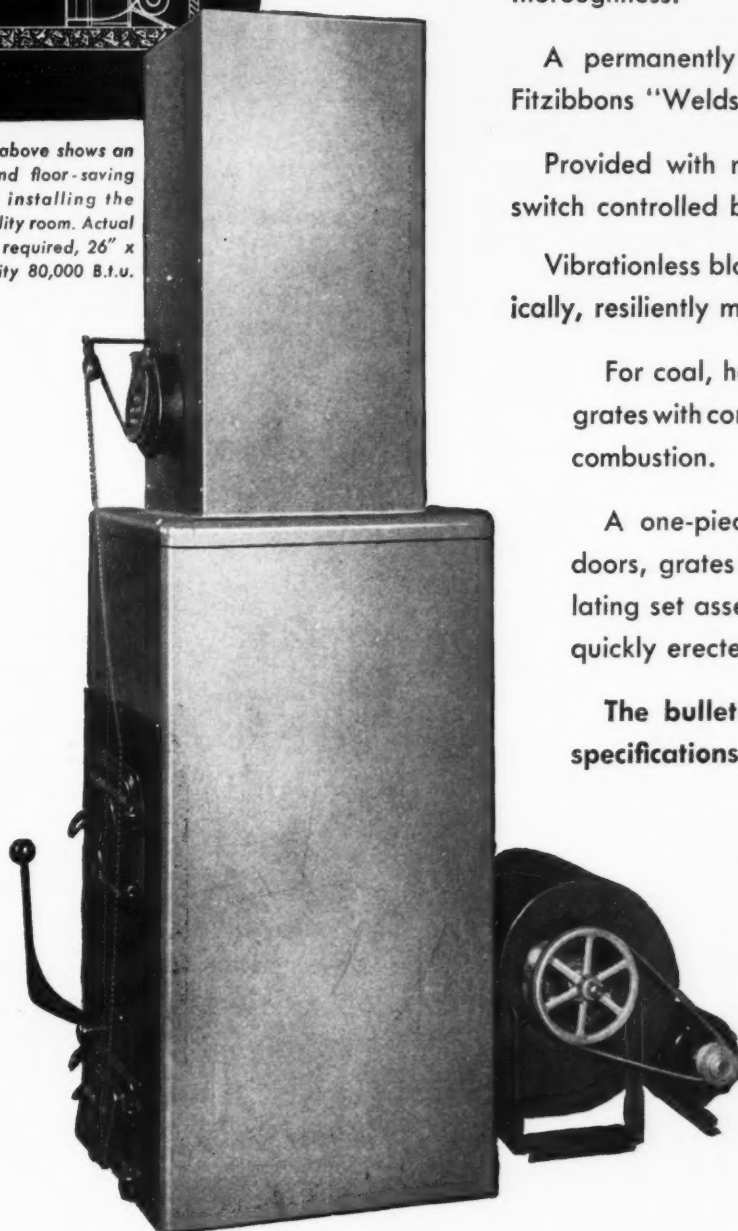
# Heat defense homes with the

# FITZGIBBONS

## 80 FWA WARM AIR CONDITIONER



The sketch above shows an effective and floor-saving method of installing the unit in a utility room. Actual floor space required, 26" x 26". Capacity 80,000 B.t.u.



Designed to government specifications, and built of heavy steel with characteristic Fitzgibbons skill and thoroughness.

A permanently dust- and gas-tight unit due to Fitzibbons "Weldseal" construction.

Provided with motor-driven blower with automatic switch controlled by bonnet temperatures.

Vibrationless blower balanced statically and dynamically, resiliently mounted for quiet operation.

For coal, hand fired. Heavy, long life grey-iron  
grates with correct size air spaces to insure complete  
combustion.

A one-piece unit, shipped with fire and ash doors, grates and firebrick liner, and hand regulating set assembled in place. Jacket and plenum quickly erected. Minimum duct work required.

**The bulletin carries the complete story and specifications. Get your copy—mail the coupon.**

**Fitzgibbons Boiler Company, Inc.**  
101 PARK AVENUE, NEW YORK, N. Y.

Send me the bulletin about the  
Fitzgibbons 80 FWA.

**Name** \_\_\_\_\_

Address.....

City and State.....



# MONOGRAM

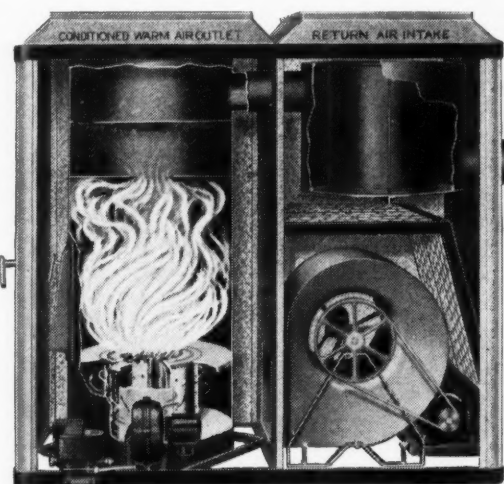
## AUTOMATIC OIL BURNING FURNACES



Model No. 250  
150,000 B.t.u.

### WINTER AIR CONDITIONERS

These units are made in three sizes, all beautifully finished in pastel green ripple, with full insulated cabinet. Model No. 125—90,000 B.t.u.—Model No. 150—120,000 B.t.u.—Model No. 250—150,000 B.t.u. Large removable panels in both the front and rear of the cabinet give easy access to both inner chambers. Double Baffle in heating drum—an exclusive MONOGRAM feature for this type of unit. Automatic Oil-Air Control set, Automatic Humidifier, Combination Limit Control and Blower Switch and Automatic Draft Regulator are all standard equipment.

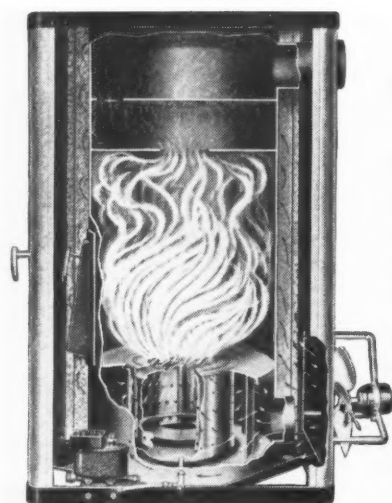


Sectional view showing Double Baffle Feature



### BOOSTER GRAVITY UNIT

Booster Gravity units made in three sizes, all beautifully finished in pastel green ripple with full insulated cabinet. Model No. 75—75,000 B.t.u.—Model No. 100—90,000 B.t.u.—Model No. 200—125,000 B.t.u. Large removable panel in front gives easy access to inner chamber and heating drum. Double Baffle in heating drum—an exclusive MONOGRAM feature for units of this type. Automatic Oil-Air control set and Automatic Draft Regulator are standard equipment. Limit control and Automatic Humidifier are optional.



Sectional view showing  
Double Baffle Feature

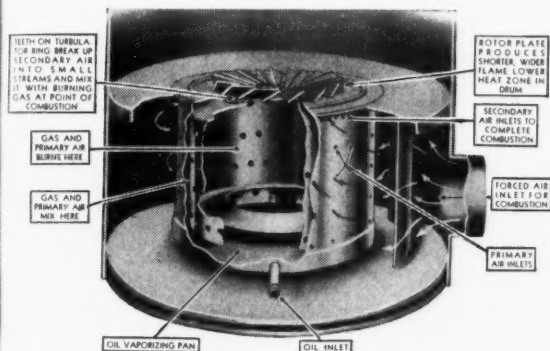


Model No. 200  
125,000 B.t.u.

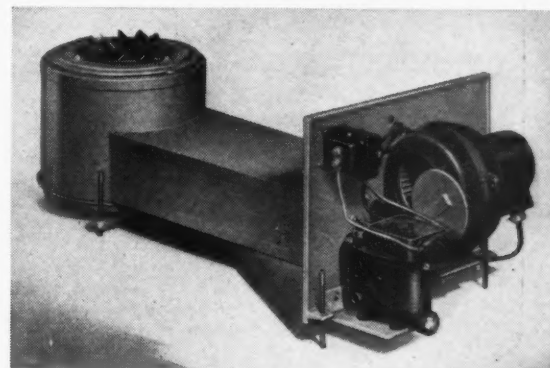
# THE QUINCY STOVE MFG. CO.



# featuring the MONOGRAM Patented Turbulent Flame "Vaporizing" Burner



**A CLEAN,  
QUIET GAS  
FLAME MADE  
FROM OIL**

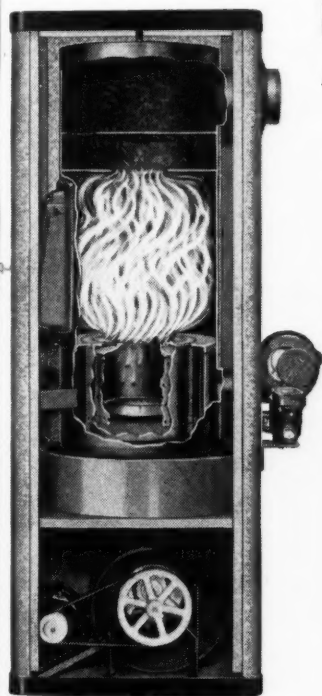


This exceptional burner has revolutionized the oil device industry by its outstanding performances and efficiency. Absolutely unlike any other oil burner on the market and definitely more efficient.

The oil is vaporized quicker, more completely and then by the proper mixture of both primary and secondary air, made possible by the exclusive MONOGRAM Patented air mixing feature, it produces a clean, quiet gas flame made from oil. MONOGRAM has used the same principle of combustion governing the gas burner and has obtained equally efficient results.

The MONOGRAM Patented Turbulent Flame "Vaporizing" Burner has definitely proven to (1) produce more heat from less oil, (2) to

produce a more efficient, clean combustion free from excess Soot or CARBON, (3) to provide the user with a more dependable and trouble-free heating service having established the highest known operating efficiency for all oil heating devices. This wonderful new burner is featured in all MONOGRAM Automatic Warm Air Oil Burning Furnaces, the units that will increase your Profits in 1942, offering a more efficient and trouble-free automatic heating service that costs less to operate. Illustrated at right above is the MONOGRAM conversion oil burner that has been designed especially for installation in warm air furnaces and either steam or hot water boilers. Made in three sizes, 8 inch, 10 inch and 13 inch and featuring the "Vaporizing" Burner.



## FULL FORCED UPRIGHT AIR CONDITIONER

Model No. 102, 75,000 B.t.u. furnished complete with Automatic Oil-Air Control set, Combination Limit Control and Blower Switch and Automatic Draft Regulator and full insulated cabinet. Automatic Humidifier and Filter optional.

Mechanical draft blower does not operate low fire position as .02 draft is sufficient for a clear low fire.

### PLENTY OF HELP FOR DEALERS

MONOGRAM has a complete merchandising program of dealer helps to be used in the promotion of MONOGRAM Furnace sales. Apply today for the exclusive dealer franchise for MONOGRAM Automatic Warm Air Oil Burning Furnaces in your territory. Write for our 24-page illustrated catalog and price list, giving complete information and details regarding all of our units.

Make your profits with MONOGRAM this year—for over 45 years manufacturers of quality merchandise.



## AUTOMATIC OIL BURNING HOT WATER HEATER

The new MONOGRAM Automatic Oil Burning Water Heater will provide plenty of hot water at all times. Extra large galvanized storage tank plus extra fast recovery rates assure sufficient hot water for all domestic purposes. 100% automatic Aquastat control provides three settings: Warm, Medium and Hot; water temperatures varying from 110° to 140° to 160° respectively. Water is heated by a 5-inch MONOGRAM "Vaporizing" oil burner which has no moving parts and operates with same high efficiency as all other MONOGRAM "Vaporizing" burners with only .01 draft. Boiler is completely insulated reducing heat loss through radiation to a minimum. No coils to clog or rust out. Automatic draft regulator furnished. Attractive outer cabinet finished in green ripple with black trim. Drop door gives easy access to burner parts. Outside thermometer gives accurate water temperature.

MONOGRAM COMPANY • QUINCY, ILL

# HOMER'S 3 Great

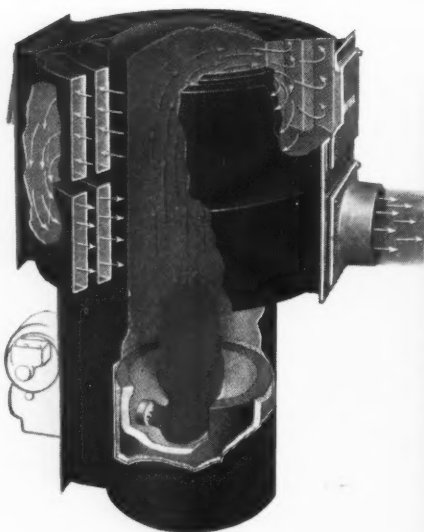


## 1 THE NEW HOMER RADIATION OIL-BURNING AIR-CONDITIONING UNIT

The Homer Radiation Oil-Burning Air-Conditioning Unit is designed to radiate warm, clean, humidified, fresh air. The large radiator has from 10 to 18 scientifically designed heat transmitting walls, depending on the size of the furnace. These walls conduct the hot gases in a continuous "stream" from the upper to the lower set of steel flues, thereby extracting all possible heat units. Hot gases "flow" like water—there are no square corners or air-traps in the "Radiation" to dam up their smooth travel.

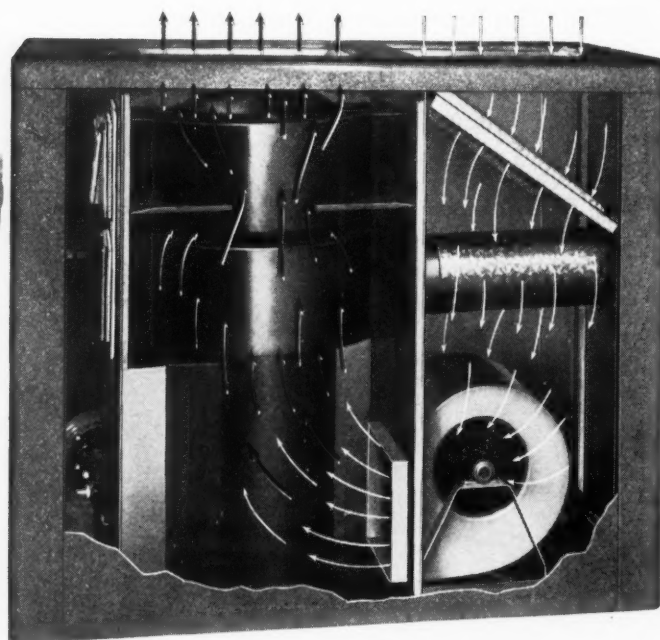
Notice the clean modern lines of the cabinet . . . as attractive as a fine piece of furniture. The beautiful blue Hammerloid finish will blend with and complement any basement, heating, or recreation room. Equipped with one of the best-gun type burners on the market. Manufactured of finest materials and engineered to scientific principles . . . it will give long and satisfactory service. Furnished with nationally-known Minneapolis-Honeywell controls, the Homer Radiation Oil-Burning Air Conditioning Unit heats, humidifies, circulates and filters the air in every room automatically, with little or no attention—at the lowest possible cost.

The famous "Radiation" radiator showing inside construction and heat travel. Notice the many curved surfaces through which the hot gases must travel in order to give up all the heat units they carry. The extraordinarily large number of square inches of heating surface, the curved walls of the radiator and the absence of air pockets, square corners or other obstacles to dam up or hinder the free passage of air account for the great efficiency and economy of this unit.



Models F-418 and F-424

Oil burner, furnace, blower, filters, controls and humidifier in one unit, easily accessible. Return air is drawn down through filters by the large, efficient blower unit and is forced into warm air chamber where it is distributed over entire heating surface of the great radiator.



## HOMER FURNACE & FOUNDRY CORPORATION

COLDWATER, MICHIGAN, U. S. A.



# New Lines of Furnaces

## **"Are Building Leadership—Based on Sound Dealer and Customer Satisfaction"...**

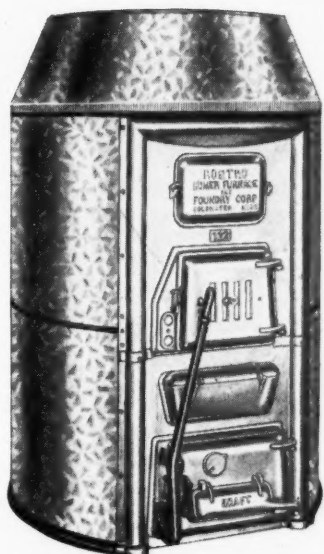
The Homer Furnace & Foundry Corporation was established in 1909 and has been manufacturing highest quality heating equipment continuously ever since . . . Pioneers in the warm air heating industry, we have achieved an enviable record in the development and perfection of the modern furnace and, in later years, the air-conditioning equipment that has gone so far toward making the American home the envy of the entire world . . . Straight-line manufacturing methods in our large, modern plant located in the center of industrial America allows us to give our customers constant improvement, sound engineering and highest quality merchandise.



**GUARANTEED**  
For 20 Years  
At No Extra Cost

### **2 THE NEW 100 SERIES HOMER AIR-CONDITIONING PACKAGE UNIT**

Engineered for perfect performance and economy of operation its modern design will prove an attractive addition to any basement, heating or recreation room . . . The beautiful grey Hammerloid cabinet encloses one of the finest heating and air-conditioning plants on the market. Modern slip-over fronts, large one-piece radiator with smoke collar cast integral, properly proportioned combustion chamber, modern duplex roller-bearing grates, large clean-out door, high one-piece ash pit. Modern automatic heat and air-conditioning in one compact unit.



### **3 THE NEW HOMER ROSTRO ROUND CASSED CAST IRON FURNACE—FOR ECONOMY AND LONG LIFE...**

Designed for satisfactory service, economy and long life, the handsome new Rostro will fulfill your every expectation . . . it is the result of more than a quarter century's experience in building warm air heating equipment and is the answer to a long-felt demand for a heating plant built to a quality standard and priced to meet the average home owner's budget. Correctly proportioned one-piece combustion chamber provides ample combustion space above the fire bed so that proper mixture of air and gases can take place. Full cast front, waist high shaker, heavy two-piece firepot, exceptionally high one-piece ash pit and one-piece radiator with smoke pipe cast integral, the Rostro has all the features of many furnaces costing much more money. Examine the illustration . . . notice the smooth, modern design of the front. The new Homer Rostro will give years of satisfactory trouble-free service and will be a constant source of satisfaction.





When the eagle seizes his prey, he takes it with *both* feet. Instinctively the bird knows the dependability of Twin Contacts. The principle by which the eagle distributes the load and increases his safety factor is the very principle which has given Twin Contact Controls their remarkable freedom from service troubles.

The performance record of Twin Contact Controls not only confirms the soundness of a principle, but also demonstrates the quality and character of their design, materials and workmanship.



# Your Equipment Works Better, Your Customers Save Fuel *with the* **MAGIC DIAL Thermostat**



With Twin Contacts to insure dependability, this thermostat incorporates another basic feature highly important for easier selling, freedom from service, and greater customer satisfaction. The Magic Dial provides a special adjustment in addition to the temperature setting.

No two heating systems are exactly alike; they differ in firing rate, size and type of firing equipment, size and arrangement of pipes or ducts, and kind of fuel used. With the Magic Dial, the homeowner can select the proper control characteristics for his particular installation, to obtain greatest comfort, avoid wasteful firing and save money as a result.

The Magic Dial is available in both standard and clock-type thermostats. Like other Twin Contact instruments, these thermostats are engineered and built for standard use with leading oil burners, stokers, and gas-fired heating equipment. They are sold only under the name of the manufacturer of equipment with which they are used.

If you sell any kind of automatic heat, ask your manufacturer about the Twin Contact Magic Dial Thermostat.



## *Twin Contact Controls*

**PERFEX CORPORATION**

500 West Oklahoma Avenue, Milwaukee, Wisconsin

**THEY GAVE IT  
THE CALL**

*for the toughest  
job of all*

• Deep in the earth beneath the sub-basement of the new \$5,000,000 Technological building at Northwestern University runs an intricate system of galvanized ARMCO Ingot Iron ductwork.

Cramped in the dark and dampness between the concrete above and the bare earth below the ducts lead a hard life. Yet they *must* survive. In this hard-to-get-at location replacement costs would be pretty steep.

Galvanized ARMCO Ingot Iron got the call for this tough job because of its splendid record—the longest actual service record of any low-cost iron

or steel sheet. ARMCO Ingot Iron culverts, for example, installed beneath the ground more than 35 years ago are serving well today.

This exceptional record of durability didn't just happen. Careful selection of raw materials, high refinement, and exacting control have maintained it year after year.

Remember these important advantages of galvanized ARMCO Ingot Iron for future use even if our Government's mounting war requirements make it hard to get all you need today. The American Rolling Mill Co., 191 Curtis St., Middletown, O.



**Galvanized**



**ARMCO INGOT IRON**





# BUILD DEPENDABLE STOKER CONTROLS

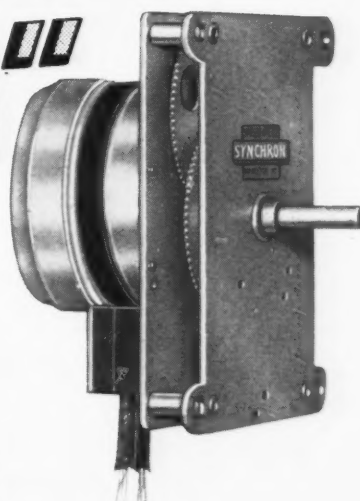
Powered by the  
Famous  
**SYNCHRON**  
"600" SELF-  
STARTING  
TIMING MOTOR



—the motor that gives you these  
precision features:

- ★ STEEL DRILL-ROD ROTOR  
SHAFTS, hardened and polished  
to assure long-lasting, frictionless  
operation.
- ★ STEEL PINIONS and BRASS  
GEARS, with perfect matching  
teeth that eliminate vibration and  
assure instant delivery of maxi-  
mum power and speed.
- ★ DOUBLE BEARINGS and LIFE-  
TIME LUBRICATION.
- ★ STANDARD SPEEDS: 1 RPM—  
1 RPH—1 RPD—1 RP WEEK—  
clockwise or counter-clockwise.
- ★ SMALL BUT POWERFUL . . .  
Pulls up to 8 oz. direct load con-  
tinuously at 1 RPM.

with  
**SYNCHRON**  
"600"  
TIMING  
MACHINES



Reduce operating failures!  
Cut service costs! Put this  
ruggedly-built timing ma-  
chine in your stoker controls. Be sure that your control instru-  
ments will give accurate, dependable service and stand hard  
wear! You can get Synchron "600" Timing Machines to oper-  
ate at all standard and many special intervals. They're easy  
to install and connect—small enough to fit in the palm of your  
hand—yet powerful enough to operate all types of stoker  
controls with an accuracy and dependability that builds cus-  
tomer good will and cuts service costs to the core.

**Send for this Special  
Engineer's Manual Today!**

This new illustrated manual will give you com-  
plete information about Synchron "600" Timing  
Machines as well as all other Synchron timing de-  
vices. Just enclose your request on your com-  
pany letterhead and your free copy of this manual  
will be mailed immediately.



**HANSEN MANUFACTURING CO., INC.**  
PRINCETON, INDIANA



**THE HOME FRONT IS  
IMPORTANT, TOO!**

● Defense Installations of P. G. R. Heating Equipment.

**F**ROM Coast to Coast — from Canada to Mexico — in camps, cantonments, barracks, training stations and defense homes — PACIFIC gas heating equipment does its bit in maintaining the high standards of health and comfort our service men deserve.

We know our job is important, and we are proud to contribute to the increased efficiency of our fighting men in camp and factory. A policy of "all out" cooperation with today's National objectives keeps the huge PACIFIC plant humming 24 hours a day.

More than 29 years of specialized engineering experience in gas heating problems plus one of the Nation's largest plants devoted exclusively to the manufacture of gas heating equipment — these are contributions for the "duration."

You, as a PACIFIC dealer, are an essential part of this effort, for you are the medium through which the jobs are secured and installed.

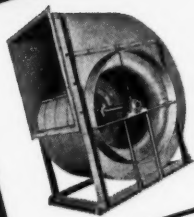
Whenever there is a need for health building warmth and comfort — in camps or training stations, in factories, in defense homes, there is your primary opportunity for service.

It is to be expected that the present defense effort will cause occasional delay in shipments for non-defense installations but every effort will be made, consistent with our policy, to fill orders as quickly as possible.



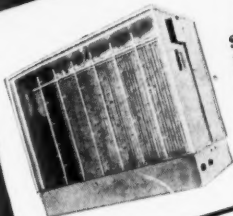
*Pacific*

PACIFIC GAS RADIATOR COMPANY  
HUNTINGTON PARK, CALIFORNIA



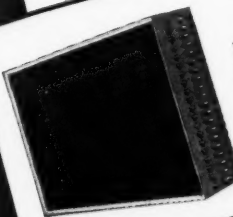
### Blowers

Centrifugal blowers with either forward or backward curved wheels, in types and capacities for every ventilating, circulating, exhausting, cooling or conditioning application.



### Air Washers

Single, double and triple stage in capacities for every job of air cleaning, cooling, humidifying, dehumidifying.



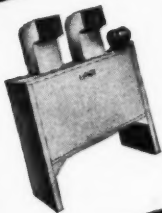
### Coils

For high or low pressure steam heating; for hot water; for cooling, drying, tempering; in every capacity for every coil purpose.



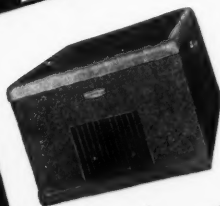
### Unit Heaters

Suspended type steam heating units equipped with Deflecto Grilles for distributing heat in any direction upward, downward or sideways.



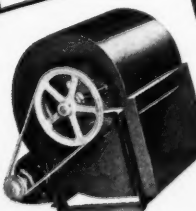
### Blower Heaters

Wall, floor and ceiling models for steam or hot water; equipped with Deflecto Grilles for full directional control of heat distribution.



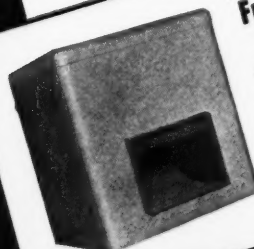
### Unit Coolers

Suspended types for cold water or direct expansion; also built for combination cooling and heating applications.



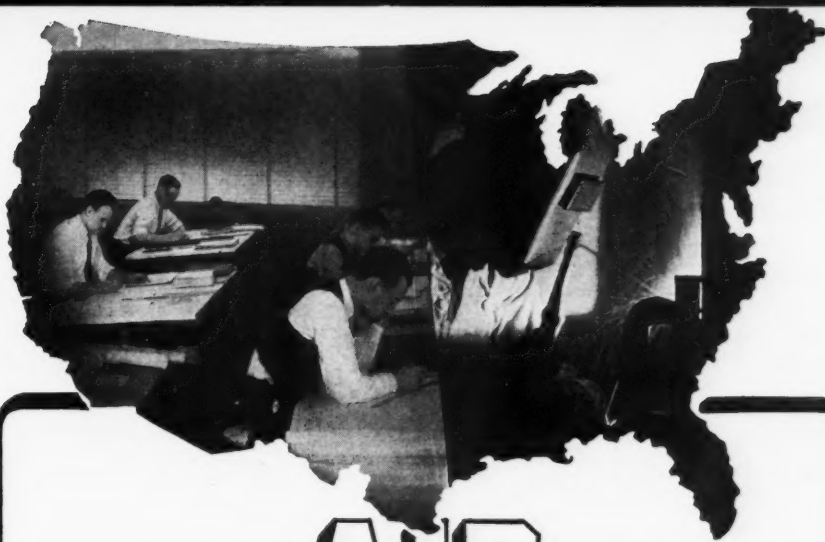
### Furnace Blowers

Complete assemblies with top, floor, front or rear motor mounts; wheels, single or twin; scroll housings. Sizes for every furnace or light duty air conditioning application.



### Furnace Blower Filter Units

Complete cabinet assemblies of blower, motor, furnace and filters for converting gravity warm air furnaces to forced air type; 800 to 5000 c. f. m. capacities.



# USAIRCO

## ENGINEERING SKILL AND MANUFACTURING INGENUITY

### *Deliver the Goods!*

**WE ARE** ready! Ready to shoulder with you the greater, the graver responsibilities war has thrust upon us. Ready to share with you the new opportunities war has created for men of courage and initiative. Ready to serve with you on the civilian front as we serve on the defense front.

For there are two fronts on which this fight must be fought and won: First, and most important, are the needs of our fighting forces; second, but none-the-less vital, are the needs of the civilian forces who must keep our fighting men supplied with the tools of war.

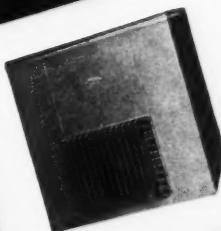
On this second front are your new opportunities: Defense housing and modernization; maintenance and repairs; new plant construction; old plant expansion; defense production. In every factory, every business place, every

home — wherever national security, morale, health and welfare are best served, there is need for your services and our equipment.

Today USAIRCO is ready to supply the equipment you need for these essential wartime jobs. And as USAIRCO engineering skill and manufacturing ingenuity continue to develop new principles of equipment design and application which conserve vital materials and increase productive capacity, USAIRCO is confident of its ability to deliver the goods — on both fronts — thruout the duration.

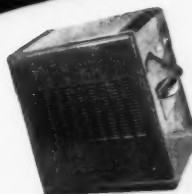
★ ★ ★

You will find usAIRCO equipment serving on the defense front on ships, at air and naval bases, in ordnance plants, shipyards, cantonments, post theatres, recreational centers. usAIRCO is also making a number of special parts for the army, navy and air force.



### Evaporative Cooler-aire

Self contained evaporative units employing patented Gyra Spray washing and evaporating systems for low cost cooling or humidifying application.



### Sanidair Humidifiers

Portable, plug-in units for winter humidification in home, office and small space application.



## UNITED STATES AIR CONDITIONING CORPORATION

Manufacturers of HEATING, COOLING, VENTILATING AND AIR CONDITIONING EQUIPMENT

NORTHWESTERN TERMINAL

MINNEAPOLIS, MINNESOTA



# These might have *Your* Taylor

*Your roofing ternes* in tanks? Yes, in a way, the roofing ternes which you might have been using today are being used for tank construction. There's no tin roof on a tank, but much of the steel which is ordinarily used to produce roofing ternes is being processed into steel for tanks and other armament.

*Production for Victory* must have first call

on steel. But eventually Republic Taylor Roofing Ternes again will be available in sufficient quantity for everyone. And our constant research—which is being intensified rather than retarded—should result in better roofing ternes than ever before.

Put Republic Taylor Roofing Ternes in your mental file—for future reference. For

Photograph by  
Signal Corps, U. S. Army



TAYLOR ROOFING TERNES—a product of

# REPUBLIC

# been some of Roofing Ternes

here is a roofing product that can show outstanding records of service.

Since 1810, these lead-tin alloy-coated copper-bearing steel sheets have provided weather-resisting, waterproof, fire-retarding roofs requiring very little more maintenance than an occasional coat of paint—roofs that won't crack, chip or warp—that

are unaffected by temperature extremes.

Republic Taylor Roofing Ternes are light in weight and easy to lay. They're profitable for you to install—and for customers to buy.

## REPUBLIC STEEL CORPORATION

General Offices: Cleveland, Ohio

Berger Manufacturing Division • Culvert Division  
Niles Steel Products Division • Steel and Tubes Division  
Union Drawn Steel Division • Truscon Steel Company



# STEEL



**RIGID!**

**TOUGH!**

**MOISTURE-  
PROOFED!**

**INSULATES!**

**LIGHT!**

**FIRE-  
PROOFED!**

**EDGE-  
SEALED!**

**SMOOTH!**

**CUTS  
EASY!**

**NAIL-  
MARKED!**

**NOW!**  
**New Improved**

**A·R·A**

**ASBESTOS • RETURN • A I R**

**SHEETS**

FOR "SHEETING" JOIST SPACES INTO COLD AIR RETURN DUCTS, TO CONSERVE METAL. "A-R-A" Sheets are rigid but not brittle . . . will withstand a blow of over 200 lbs. per square inch . . . smooth surface . . . can be painted . . . don't buckle . . . edges are sealed . . . "chalk-marked" for nailing . . . deadens sound . . . one man can install . . . attractive . . . inexpensive. Specifications: Sheet Size 33" x 48". Thickness 3/16". Weighs about 5½ lbs. per sheet. Packed 20 sheets to a carton. Use "A-R-A" Sheets and save your sheet metal for fabricating purposes.

*Order "A-R-A" Sheets from your Regular Steel Jobber*

**GRANT WILSON INC. CHICAGO**  
4101 W. TAYLOR STREET



# Equip with Thermo-Drip

PUT THE AMAZING FEATURES OF THIS HUMIDIFIER TO WORK FOR YOU...AND CLINCH SALES WITH "Measured Moisture"

**Larger Evaporating Area**  
Effective evaporating area is yardstick by which to measure humidifier performance BEFORE you buy. These broad, shallow pans give you more!

**Stainless Steel Pans**  
The best for humidifier service. Affords scores of advantages over heavy iron or enamel-coated pans — notably longer life, better performance, more "buy appeal", easier sales. No price premium!

**Feed Valve Not Enclosed**  
Important! Open yoke design banishes liming, sticking, clogging because valve cannot heat up, the basic cause of liming, etc.

**Thin, Bare Metal Pans**  
Here's more proof of quicker evaporation because heat transfer is highest. Abolishes need of ceramics or other auxiliary vaporizers in most installations.

**Thermostat Governs Water Feed**  
Exclusive Thermo-Drip Feature. Keeps moist vapors in tune with temperature fluctuations. Admittedly the best method of balancing humidity and heat.

**Drip Feed Direct to Heated Pan**  
No brimful pan of water to heat to vaporizing stage. Parade of water drops keeps pan surface scarcely more than moist... ideal for vaporizing.

**Sight Feed**  
No guessing or uncertainty about operation of this humidifier—drops of water leaving valve are in plain sight. Facilitates adjustments.

**Easier to Adjust**  
Just a slight turn of wheel with thumb and forefinger produces desired amount of evaporation for individual preference or need.

EVERY JOB A "Tailor Made" INSTALLATION

**T**ODAY it is vitally necessary that your furnace installations produce *healthful* warmth... the kind of indoor atmosphere that has the proper balance of moist vapors and temperature. For, you can't expect all-out defense effort from folks who suffer from the misery of colds and the other winter ailments which are so often attributed to parched, hot air.

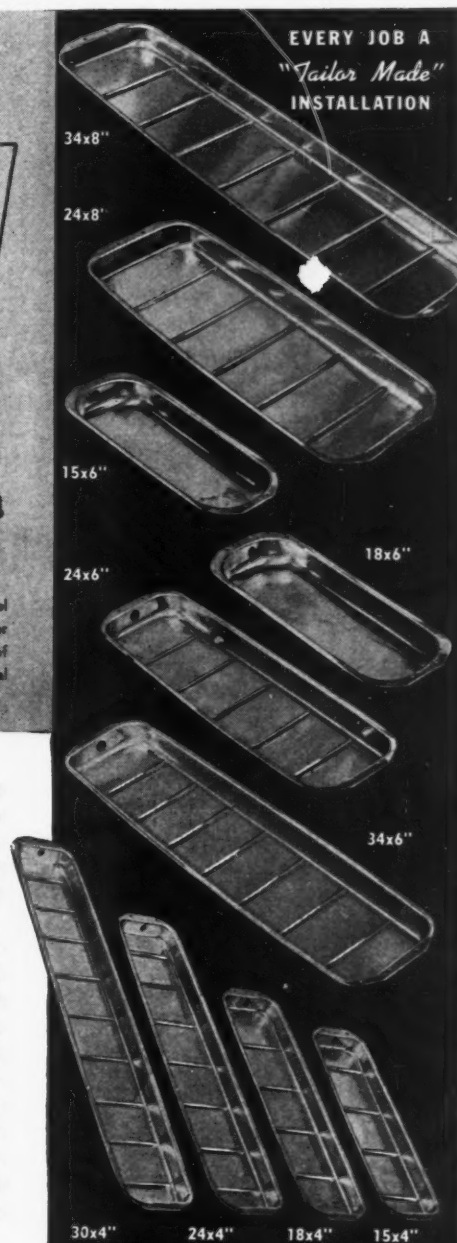
Every furnace that you equip with a THERMO-DRIP assures properly balanced atmospheres in the home. The sheath of water this humidifier has in its thin *bare stainless steel* vapor pan at peak temperatures... the modulated water feed by a valve that is automatically opened, throttled or closed in direct proportion to the heat in the furnace bonnet... the easy adjustability to meet the individual requirements of every dwelling... these matchless features contribute to greater furnace efficiency. And they mean more than money to you; they mean prestige, and the satisfaction in knowing you are holding up your end—with *healthful heating*—in the enormous job we're all doing.

Consult your wholesaler or write us today for complete details



**AUTOMATIC HUMIDIFIER CO.**  
MANUFACTURERS

CEDAR FALLS, IOWA





**4**  
*times as fast!*

**--- WITH ONLY ONE-TENTH THE OPERATOR FATIGUE!**

It's easy, during the early morning, to pound down the "hammer over" edge of a Pittsburgh Lock; but the old arm gets pretty tired long before quitting time. **UNLESS, OF COURSE, YOU'RE USING AN APPTON!** For the Appton Super-Air Hammer, designed especially for the Sheet Metal Shop, delivers the same effortless efficiency all day long—not only turns out the work four times as fast, but just about eliminates operator fatigue.

A single adjustment (the knurled ring) regulates the force of your blows from a gentle "nudge", for the lightest gauges, to a real smashing impact, for heavy iron. The special guide makes the tool almost fool-proof, the operator merely, holding it at about a 45° angle for the first pass over the work—then finishing with the tool held in the vertical position. We'll guarantee that you'll be astonished at the way this new tool makes an already "easy job" **TEN TIMES AS EASY—FOUR TIMES AS FAST!**

## A LOCKFORMER PLUS AN APPTON MEANS REAL EFFICIENCY

The Appton is the ideal "running mate" to your Lockformer . . . capitalizes fully on the sensational speed of the Lockformer itself. As repeatedly proven, one man and a Lockformer can make more Pittsburgh Locks than sixteen men working at eight brakes. And now, with the advent of the Appton, one man can do the work of four in turning down the standing edge.

Lockformer Company,  
4615 Arthington St., Chicago, Ill.  
Gentlemen: Please send me facts on  
☐ the Appton Super Air Hammer  
☐ the Lockformer Line

Name .....  
Address .....  
City ..... State .....

Send the coupon for full facts on this new air hammer especially designed for the Sheet Metal Shop—and, unless you're already using a Lockformer, it will certainly pay you to get complete information on this equipment, tool



# THE **LOCKFORMER** co.

4615 ARTHINGTON STREET, CHICAGO, ILLINOIS

# A MESSAGE

*to the*

Heating  
Ventilating

**and**

Plumbing  
Trades





**TO OUR  
DEALERS AND DISTRIBUTORS  
EVERYWHERE**

**I**N turbulent and critical times like these, it is well to deal in retrospection and take an accounting of our stewardship of those responsibilities placed in our hands. During the past months, makers of every sort of product have been called upon to adjust, reorganize or completely change their methods, policies and procedures in order to contribute in full to the needs of the nation's security and future welfare.

That the producers of this broad land have responded to the challenge, there can be no doubt. Because everywhere are shining examples of the sincere loyalty and profound respect with

which the emergency has been met. It is to be expected that this spirit will continue to prevail as long as our country needs it.

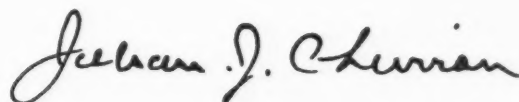
In our own particular sphere of activity, we have given freely of our efforts and productivity. The finished products of our employees may be found in projects that are vital to the nation's security in every part of the globe. People in the United States, South America, Mexico, Alaska, Phillipine Islands, Canada and in many countries of the Eastern half of the world are enjoying the benefits of the processes of our plants.

We are proud of the privilege afforded us to contribute our share to the tremendous undertaking in which our country is involved. We further pledge our resources and skill to whatever duty we may be called upon to perform in the future.

In dedicating ourselves to this policy, we are not unmindful that our dealers and distributors, too, have had to make sacrifices and indulge in curtailments of business, and suffer embarrassments because of failure to receive merchandise. This state of affairs has been costly and, in some instances, almost serious. But we are sure that those business houses that have honored us with their patronage would not have it otherwise, since their loyalty and patriotism is every bit as sincere and complete as ours.

We take this opportunity, therefore, to thank those members of the trade who have borne with us thus far, and to ask that they continue to give us their support and cooperation in these trying times so that when the job before us is finished, a happy and mutually profitable association will again be enjoyed by all.

Sincerely yours,

A handwritten signature in cursive script, reading "Julian J. Churnian".

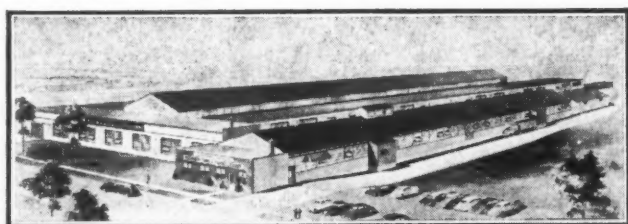
President

MICHIGAN TANK & FURNACE CORP.

# Comfortzone

## AMERICA'S FINEST STEEL FURNACES FOR OIL, GAS AND COAL

OIL FIRED (PRESSURE BURNER) WATER HEATERS



Plant No. 2—Dearborn



Plant No. 1—Detroit

# Lochinvar

## OIL AND GAS FIRED STEEL FURNACES FOR SMALL HOMES

OIL FIRED (VAPORIZING BURNER) WATER HEATERS

### Michigan Tank & Furnace Corp.

Detroit, Michigan

Makers of

ALL STEEL FURNACES, RANGE BOILERS, OIL FIRED WATER HEATERS

OIL STORAGE TANKS & SPECIAL STEEL TANKS OF ALL TYPES,  
BLACK OR GALVANIZED





Cut-away section of large single oil reservoir ball for One-Piece Steel Housing Pillow Block.



One-Piece Steel Housing Pillow Block with single or double oil reservoir and with or without rubber insulation.

Cut-away section of double reservoir ball for One-Piece Steel Housing D. R. O. R., Universal and Flange type Pillow Blocks.



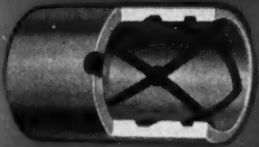
D. R. O. R. Pillow Block



Universal Pillow Block



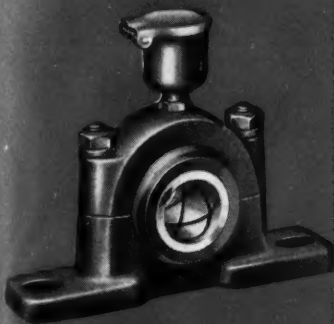
Flange Pillow Block



Cut-away section of Randall Graphite Bronze Oil Reservoir Bushing or Bearing.

### RANDALL GRAPHITE BRONZE OIL RESERVOIR BUSHINGS OR BEARINGS

Many thousands of Randall Bronze Bearings are being used for Army, Navy, aircraft and other Government requirements. They operate satisfactorily under the most severe conditions. Randall Bearings have machined grooves permanently filled with porous lubricating graphite which provides and retains lubrication. The graphite acts as capillary wicks when used in connection with oil reservoirs, and provides controlled, proper and efficient graphite and oil lubrication to the shaft. Our Engineering Department will gladly co-operate. Let us quote on your specifications.



Standard Pillow Block.



Cut - away section of large single oil reservoir ball for Standard Pillow Block.

## WAR PRODUCTION EQUIPMENT REQUIRES DEPENDABLE BEARINGS

Only an industrial *blitz* can now meet the terrific demands of the war program. Maximum production must be wrung from every machine and man. *Industry must not falter!*

That means machines dare not stop—bearings must not fail—even with the new speed-up and lack of attention that may follow.

## SPECIFY *Randall* PILLOW BLOCKS and GRAPHITE BRONZE BUSHINGS

Randalls give the dependable efficient service required to keep war production equipment operating smoothly. They can be adapted easily to take the place of other bearings perhaps not now available. Consult Randall engineers about any bearing problems you may have.

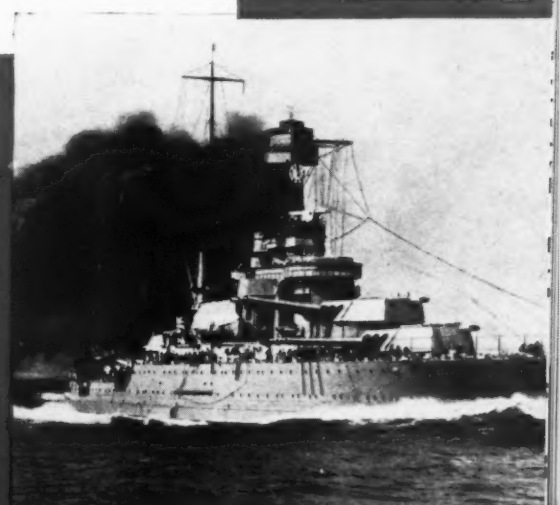
## MORE THAN 134 MILLION RANDALL PILLOW BLOCKS HAVE BEEN INSTALLED ON ALMOST EVERY TYPE OF EQUIPMENT

Randalls are self-aligning, self-lubricating, economical and easy to install and give long, trouble-free, *quiet* service with only minimum attention. That is why in the air-conditioning field, more air-handling units are equipped with Randall Pillow Blocks than any other. Behind every Randall is over a third of a century's engineering experience in the design and precision construction of efficient bearings.

Randall engineers will work with you without obligation to assure prompt equipping of your units with dependable bearings.

Only Winning Of The War Counts Now  
The exposition was called off. America is at the grim business of war. Neither money nor effort should now be misdirected. *Nothing else matters.* We are eager to co-operate on bearing problems developing from increased war production, and during the Convention week of January 26th, our sales engineers will be located at the Ben Franklin Hotel. You are invited to discuss your bearing problems with them there.

# RANDALL GRAPHITE PRODUCTS CORPORATION





# WANT HELP?

**— Need Any Type of Fan  
Equipment? THEN CALL ON CLARAGE!**

*On the job in World War One . . . on the job NOW!*

- ★ Our plants are working at 100% capacity, turning out air handling and conditioning equipment in ever expanding volume, as required to speed vital war production and maintain other essential services.
- ★ Whenever you have a vital air conditioning, ventilating, heating, humidity control, air exhaust or pneumatic conveying problem, Clarage can give you the kind of assistance so necessary in these strenuous times.
- ★ Certainly *speed* is a big factor — but we also know that *accuracy* of recommendations and *dependability* of product are important, too. When you come to Clarage you get all three!
- ★ We are prepared, through our country-wide sales-engineering organization, to give you immediate, first-hand help — and it's *expert* help in which you can have implicit confidence.
- ★ We are prepared, by virtue of more than a quarter-century of experience, to furnish you with equipment that will produce results as specified, and give lasting satisfaction.

*In war, as in peace, it pays to call on Clarage!*

---

**CLARAGE FAN COMPANY, Kalamazoo, Mich.**

# Here are Some of the More Widely Used CLARAGE PRODUCTS

## VENTILATING FANS

**Applications** — Used in ventilating, cooling, heating or complete air conditioning of industrial plants, war service buildings, army barracks, etc. Built in two types as shown at right, and in 28 sizes with capacity range from 200 to 100,000 c.f.m.

Clarage dust-proof, oil-tight bearings standard equipment on both types of fans; ball bearings furnished if desired. In smaller sizes, both types reversible for any of 8 directions of air discharge.

Type HV are SLOW SPEED fans, designed particularly for belt drive — practically silent in operation. Type W are HIGH SPEED fans, designed for either direct motor or short center V-belt drive.



TYPE HV



TYPE W



UNITHERM



CLARCO

## UNIT HEATERS

**Applications** — Used for heating industrial plants, warehouses, war service buildings, etc., utilizing either steam or hot water. Wide range of sizes in both types shown at left.

Unitherm Units are LARGE AREA heaters. Aside from floor type heaters, they are also built for ceiling or wall suspended operation. Easily and quickly installed.

Clarco Units are SMALL AREA heaters, and for helping out where more heat is needed. Designed for ceiling or side wall installation only. Quiet in operation.

## EXHAUST FANS

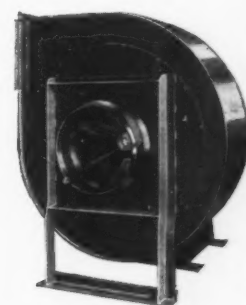
**Applications** — Used in all kinds of exhaust and pneumatic conveying work, with dust collecting systems, removing fumes, etc. Clarage dust-proof, oil-tight bearings standard equipment; ball bearings furnished if desired. Wide range of sizes.

Standard Exhausters (see both types at right) operate at speeds suitable for either belt or direct motor drive. Type LH Exhausters operate at particularly slow speeds, and are extra efficient.

In the smaller sizes, both types are reversible for any of 8 directions of air discharge.



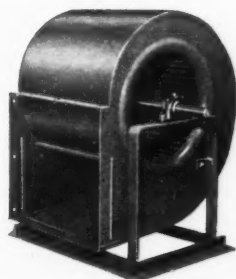
STANDARD



TYPE LH

## FURNACE FANS

These small centrifugal fans are widely used in connection with warm air heating installations in army barracks, homes for defense workers, etc. They operate at low speeds — extremely quiet in operation. Built in 10 sizes with capacities from 200 to 5,000 c.f.m.



Units can be furnished as complete fans with or without inlet boxes. Or we can furnish wheels only, housings and wheels only, or any other combination of parts required. With a high percentage of furnace manufacturers, Clarage Fans are standard equipment.



## UNICOIL HEATERS

These assemblies form integral parts of central station systems for heating, cooling or complete air conditioning. Large range of sizes.

Standard unit consists of finned-copper coils, eliminator plates, galvanized settling tank with drain, and galvanized casing. Air filters and spray nozzles can be furnished if desired.



The assembly combines in a single structure all elements necessary for efficient heat transfer, eliminating the need for assembling many different parts on the job, thereby saving time and money.

**Sales-Engineering Offices in All Principal Cities**



*Instant*  
**COMBUSTION  
EFFICIENCY**

*Immediate*  
**SAVINGS**

*Also...*

**FIRE BRICK for Every Purpose  
Special Fire Brick Shapes  
High Heat Insulating Materials  
Clays, Plastics, Castables  
Large Stock and Quick Service**

**Baffles, Hearths and Insulat-  
ing Cement for Oil Burners**

*With*

**REX RoTo**  
**COMBUSTION CHAMBERS**

**PAT. PENDING**

**The REX CLAY PRODUCTS COMPANY**  
**14414 Dexter Boulevard - - - - - Detroit, Michigan**

# VITROLINER

## -the Superior Vent Pipe

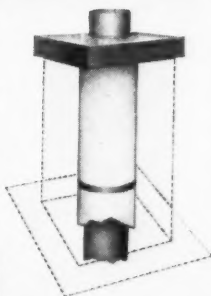
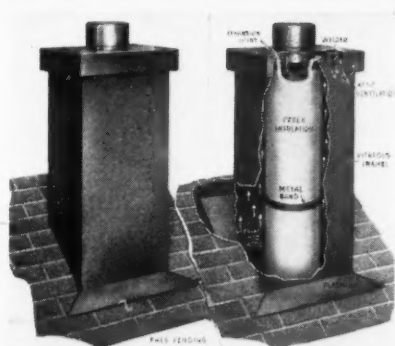
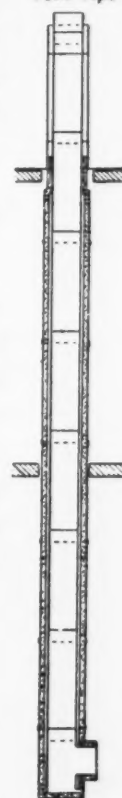


**Eliminates the Standard  
Masonry  
Chimney**

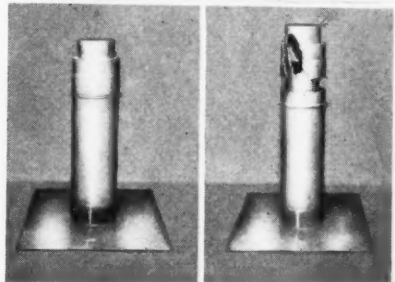


Vitroliner Venting is the modern way of saving valuable space, increasing the draft and efficiency of the heating plant by providing added draft. Vitroliner is safe, durable, economical, and is convenient for any type construction.

Diagram of  
Vitroliner  
Outlet  
Vent Pipe



"Low Cost Vitroliner Chimney." Dotted lines indicate outer wall sheet metal housing and flashing which can be furnished and painted by local contractor.



Vitroliner Chimneys at left are made of Armco iron, heavy gauge enameling stock with special enamel finish. Vitroliner is manufactured of highest quality materials obtainable. This insures long life. Will not rust, corrode, or be affected by salt air conditions.

Vitroliner is now being used extensively in low cost housing projects.

Vitroliner is a practical venting system. It consists of lengths of acid resisting vitreous enamel coated steel pipe and fittings which are insulated with high temperature Fyrex prefabricated asbestos. Vitroliner can be installed inside of walls or partitions, and provides an adequate means for venting gas, oil, and coal appliances.

*Look into the Vitroliner Venting system further. It will prove profitable to you. Write for circular.*



**CONDENSATION  
ENGINEERING  
CORPORATION**

**FOR DETAILS**  
and further information  
write to us.

2515 ARCHER AVENUE • CHICAGO, ILL. • PHONE CALUMET 4362

## Our Mutual Task

**T**HERE can be no better time than this beginning of 1942 to thank our customers for their unfailing patience and the consideration they have shown in the past twelve months toward our efforts to supply the myriad emergency demands for steel.

Today you as consumers and we as producers of steel have a mutual task of achieving the maximum output of materials for war. We must also produce materials for the indispensable minimum of goods for our domestic economy.

The coming of active warfare has made our mutual task as the year opens increasingly arduous. Bethlehem is exerting the utmost effort to meet unprecedented demands. It is our purpose to serve our Government to the utmost of our ability in this emergency. More than 800,000 tons of steel capacity has already been added, together with accompanying increase in coke

ovens and blast furnaces, and expansion of finishing facilities. Further expansions in ingot capacity, and in rolling mills, forges and shops, are anticipated. We are purchasing a wide variety of materials from more than 10,000 suppliers. Our employment rolls have been stepped up to more than 180,000.

With all of this, the demand for our products continues unabated, and 1942 will continue to require the full cooperation and understanding between steel maker and steel user.

It is a gratifying and typical characteristic of American industry that all the needs of our Government and of our national purpose have been met on all sides during the past year with vigor and cheerfulness.

Now is added a still greater and unremitting determination. We know that there will be the whole-hearted cooperation of all, so that what needs be done, shall be done.

*"Enough, if something from our hands have power,  
To live, and act, and serve the future hour."*

## BETHLEHEM STEEL COMPANY







## *New Series* **NIAGARA** POWER SQUARING SHEARS

*Capacities 18 gage to 1/4 inch—Cutting Lengths 4 to 12 feet*

**for Accurate Cutting**  
**. . . . . Fast Operation**  
**Convenience and Safety**  
**Low Maintenance Cost**

These New Niagara Shears cut sheared edges and narrow strips straight to within a very few thousandths of an inch. They operate at speeds up to 85 strokes per minute. High production squaring and trimming are assured by the instant acting sleeve clutch, quick release of holddown and convenient operation.

Standard equipment includes direct-connected motor, ball bearing, self-measuring, parallel back gage reading to 1/128th inch increments, front and side gages, and four edge, solid tool steel knives.

They are built in a complete range of sizes from 4 to 12 foot cutting lengths, and capacities from 18 gage to 1/4 inch.

**NIAGARA MACHINE & TOOL WORKS, BUFFALO, N. Y.**

*Branches: 50 Church St., New York; Leader Bldg., Cleveland; General Motors Bldg., Detroit*

# BIG MACHINE FINISHES DUCT SHEETS

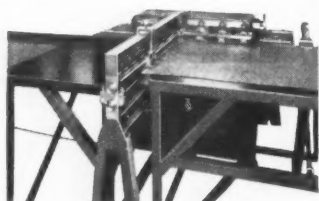
Whitney-Jensen Combines Standard and Special Units to Provide Forming of Edges, Cutting to Proper Width, and Notching of Corners. Three Operators Handle Continuous Production.

• Production-line processing of duct sheets of various widths is provided by this assembly designed and built by Whitney-Jensen. It is in use right on the job in a huge new war materiel plant where thousands of feet of duct work are to be installed. Operations are as follows: a sheet is placed on the first table against back and end gauges. A foot treadle operates two special punches to notch the corners. The sheet is passed through the first rolling machine which forms a Pittsburgh lock along the edge, and at the same time a slitting shear cuts the sheet to the required width. On the second table, the sheet is notched at the corners of the trimmed edge, and goes through the second rolling machine which forms a standing seam. Finished sheets are delivered from the table at the far end. The two additional foot presses shown can be used separately or moved up to the tables for extra notching operations. Production on the machine averages 640 lineal feet per hour.

**AN OUTSTANDING EXAMPLE OF  
WHITNEY-JENSEN ENGINEERING**

Position of the three operators is indicated at A, B, and C. Operator A takes sheets from the pile, notches them, and starts them through the first rolls and slitter. Operator B notches the sheets as they are delivered and starts them through the second rolls. Operator C removes the finished sheets.

## DETAIL OF FIRST ROLLING MACHINE and SLITTER



This close-up shows the far end of the first table. Note the adjustable slitting shear assembly, which is driven off a pair of spindles on the rolling machine. This rugged assembly assures accuracy in slitting the sheets to uniform width, and can be easily changed for the various widths required.

**WHITNEY METAL TOOL CO.**  
ROCKFORD ILLINOIS

# WHAT IT TAKES TO BE A

# Leader

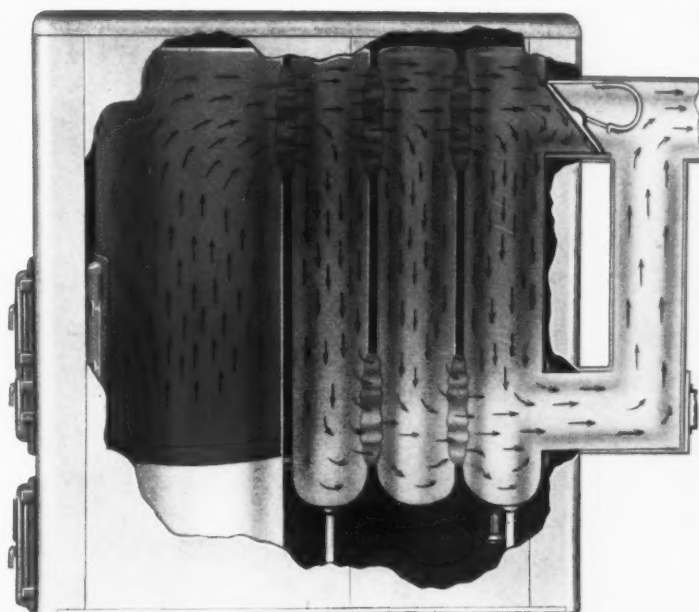
Only Leader dealers have this great sales feature. Patented automatic Damper makes possible fuel savings as high as 40%.



## KOOLSTACK FURNACES PUT MORE HEAT TO WORK

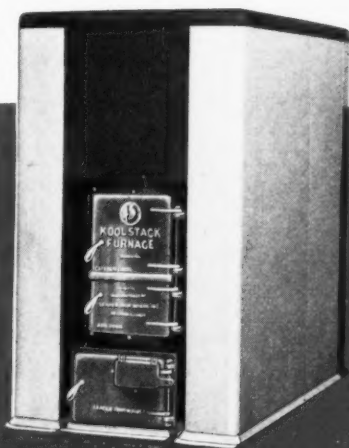
Economy is the greatest sales advantage of the day—in any field, in all fields. Home owners everywhere WANT economical heating. And they can readily appreciate the savings made possible by the Leader Automatic Damper. Sell the KOOLSTACK line—the line that enables you to give customers EXACTLY what they want.

Cabinet or round-cased type . . . For oil burners, stokers, hand-fired . . . Forced or gravity circulation . . . In sizes for heating loads from 50,000 to 200,000 B.t.u.'s. . . All welded construction—permanently gas and smoke tight . . . Quickly, easily handled and erected by one man.

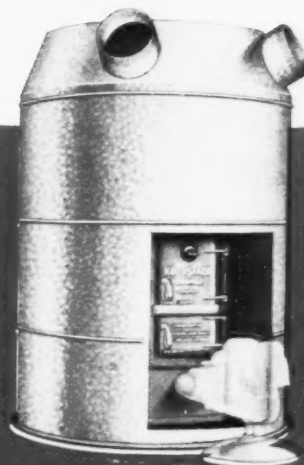


The KOOLSTACK Principle is amazingly simple. Notice the cut-away view above. When the firing period starts, a momentary charge of heat, shot direct to the chimney, creates proper draft. The heat closes the PATENTED AUTOMATIC DAMPER, thereby sending the hot gases through the economizer sections until every possible unit of useful heat is absorbed. The gases then pass out the bottom of the stack at a moderate pre-determined temperature. No complicated mechanism—nothing to get out of order. Write or wire for money-making facts about the Leader KOOLSTACK line.

**LEADER IRON WORKS, INC., DECATUR, ILLINOIS**



KOOLSTACK furnace with crinkle finish, two-tone, cabinet. A size and type for every job—oil burners, stokers, hand-fired.

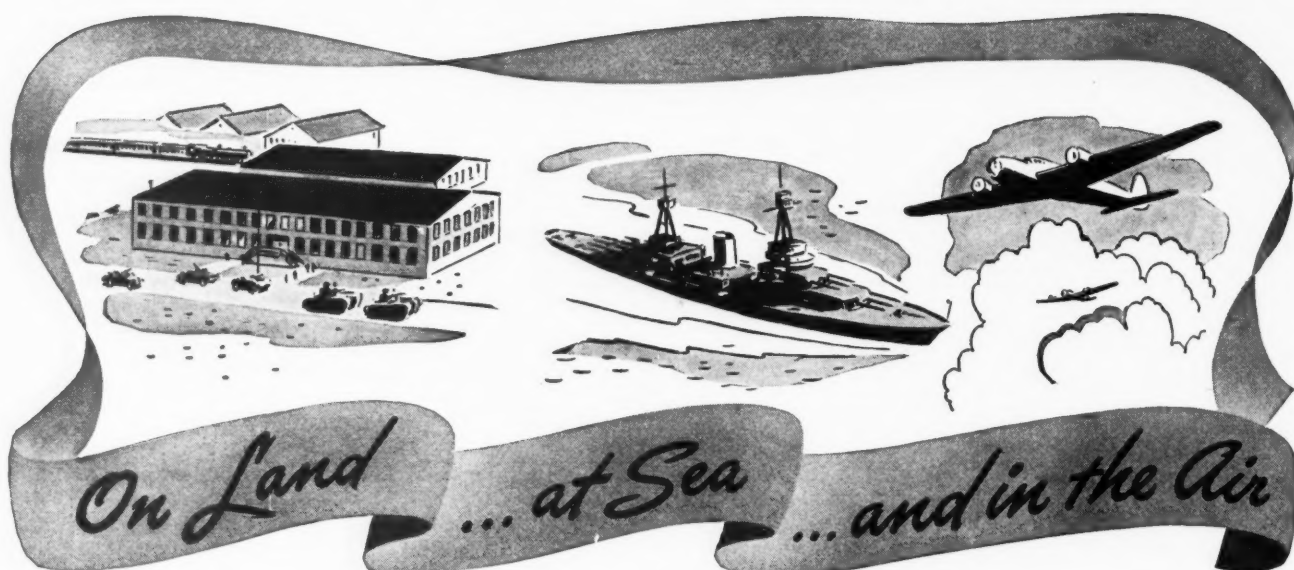


Round-cased KOOLSTACK furnace. Forced air or gravity circulation optional in all types. Combustion chambers in two sizes.



Leader KOOLSTACK furnace with blower attached outside the cabinet. Unit can be furnished completely self-contained with blower enclosed in cabinet casing where desired.





## ★ **AIR-MAZE Filter Panels** ★ are serving Vital Defense Needs

**I**N TODAY'S war of machines, AIR-MAZE Filter Panels are called upon to serve the National Defense program in countless important ways:

**ON LAND** . . . AIR-MAZE Filter Panels are used for ventilating systems in army camps, on trains, in busy airplane factories and other plants producing defense materials . . . for filtering intake air on engine test blocks . . . for paint spray booths, for freeing inside air from oil, moisture and dust.

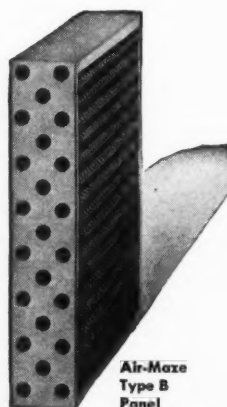
**AT SEA** . . . U. S. military craft are using AIR-

MAZE filter panels for ventilating systems of galleys, stoker rooms and other applications on ships. Another notable example is the famous Mosquito Fleet which depends on AIR-MAZE filters to keep the engines at highest efficiency.

**IN THE AIR** . . . all types of military aircraft use AIR-MAZE AIRCRAFT Filter Panels to protect engine air intakes. Airports also use AIR-MAZE Filter Panels in their air conditioning trucks to service transports and contribute to the comfort and health of patrons and crews.

For defense or peacetime activities . . . on ship, aircraft or train . . . in factory, warehouse or residence, wherever you have an air filtration problem AIR-MAZE Filter Panels will meet the exacting requirements efficiently and economically. AIR-MAZE Filter Panels are of sturdy all-metal construction and *approved by the Underwriters' Laboratories*. Washable and permanent they need no replacements. If you have a troublesome air filtration problem, write us today. Our engineers will make a study and recommend a practical solution.

**AIR-MAZE CORPORATION**  
5130 Harvard Avenue • Cleveland, Ohio



Air-Maze  
Type B  
Panel





# Uncle Sam Orders STANDARDIZATION!

so **FRONT RANK** now makes

ONE STANDARD STEEL FURNACE  
DESIGN IN SEVEN SIZES

**NEW** • Lower grate level — better for stoker installations.

- Lower feed door — easier to hand-fire or remove clinkers.
- Longer distance above feed pouch — adds radiating surface, increases capacity.
- Re-designed duplex grates, much easier to install or repair.
- Re-designed front, may be used for either round or square casings.

CONTINUING THESE ADDITIONAL FEATURES

- 3-flue radiator, gives longest positive fire travel.
- Full size radiator for each size furnace.
- All shielded arc-welded construction.
- Boiler plate steel, No. 7 gauge head, No. 8 gauge body.
- Radiator collar heavy cast iron, tongue and groove connection.



*And*



## ONE STANDARD CAST IRON DESIGN IN SIX SIZES

OUTSTANDING FOR THESE REASONS:

- One-piece radiator from clean-out door to smoke pipe connection.
- Corrugated combustion chamber has large opening into radiator forming secondary combustion chamber.
- Heavy ribbed two-piece fire pot.
- Duplex grates with waist high shaker handle. Outer ring moves on ball bearings.

FRONT RANK IS EQUIPPED TO SERVE  
YOU IN 1942 • BETTER THAN EVER

*Write for our sales-building dealer proposition*

**FRONT RANK FURNACE CO.**

2500 OHIO AVENUE  
SAINT LOUIS, MISSOURI

Manufacturers of . . . CAST IRON FURNACES . . . STEEL FURNACES

# Add Character to Your Business

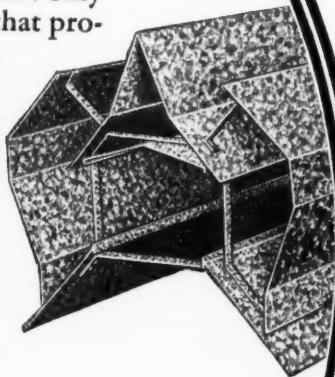
WITH

## Swartwout Premium Quality Roof Ventilators

YOU always do your best and most profitable work with high quality materials and equipment. This year recommend Swartwout Roof Ventilators to your customers. You insure their satisfaction and establish yourself as a first line operator. Swartwout Ventilators are *premium quality* not only in material and construction but in scientific design that produces unusual results in proportion to the size used.

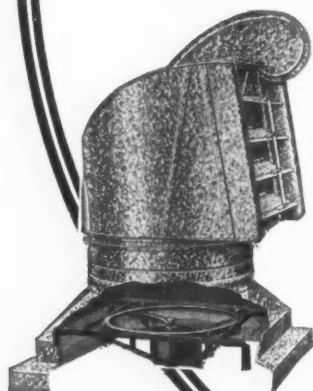
### Swartwout-Dexter Heat Valve ▶

For large scale ventilation at economical cost! Patented features assure highest efficiency. It's the first *continuous* roof ventilator ever produced; now embodies all of the latest improved features. Gives your customers more square feet of opening per dollar invested.



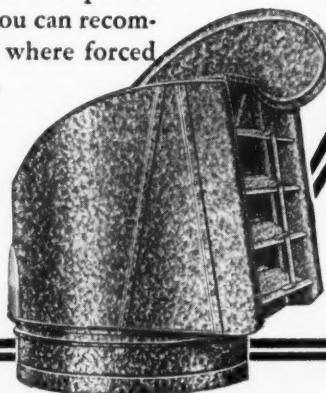
### ◀ Swartwout Airjector

Power roof ventilation at its best! Combines low-cost power air movement, gravity flow and suction effect. You can recommend it as a highly efficient ventilator for use where forced movement is required or where the load varies.



### Swartwout Rotary ▶

Industry's quality ventilator for a third of a century! You can honestly promise *more capacity for the size of ventilator used* and a lifetime of trouble-free operation.



### ◀ The STANDARD VENTILATOR for Emergency Defense Construction

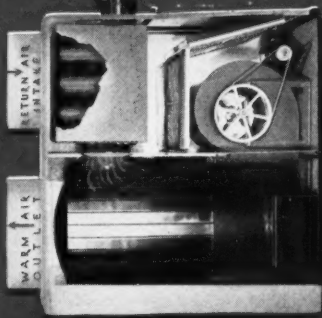
Thousands of these Swartwout Round Unit Ventilators have been installed. They meet standard specifications of government departments for the emergency construction. Made in required sizes, of materials to meet individual needs, the Swartwout Unit Ventilator combines low-cost with unusual efficiency. . . . Write for Bulletin No. 212.

THE SWARTWOUT CO., 18511 Euclid Ave., Cleveland, Ohio

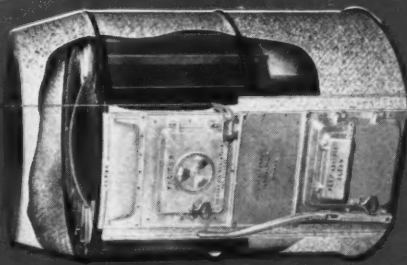
● WRITE for  
new complete  
1942 Catalog

★ **Swartwout** ★  
**VENTILATION SPECIALISTS**





1 THE VICTORSTOKE  
MATCHED UNIT



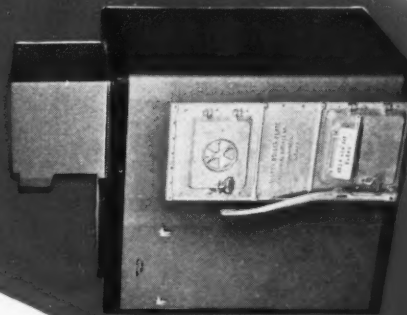
3 VICTOR DELUXE FIN  
RADIATION FURNACE

5 HALL-NEAL  
VICTOR STOKER

"V for Victor Heating Equipment"  
... symbol of more than 50 years of  
manufacturing excellence, engineer-  
ing skill and a thorough knowledge  
of your customers' requirements  
— and yours. Sell and install  
Victor Heating Equipment  
for greatest customer  
satisfaction and pro-  
fited profits. Write  
for complete  
details today



SERIES "F" VICTOR 2  
HEAVY DUTY



VICTORAIRE WINTER 4  
AIR CONDITIONER

HALL-NEAL 6  
VICTOR OIL BURNER



## THE VICTOR LINE

The VICTOR line is most complete — it includes VICTOR Steel Boiler Plate Furnaces for gravity heating and winter air conditioning, steel VICTORGAS Units for gravity and forced air, cast VICTORGAS Units, VICTORSTOKE and VICTOROIL Fin Radiation Units featuring matched design of furnace, air-cleaning blower and stoker or oil burner, Heavy Duty Heaters for large, hard-to-heat buildings, VICTOR Cast Iron Furnaces, Automatic Stokers and Oil Burners, blowers, controls, registers, fittings and accessories.

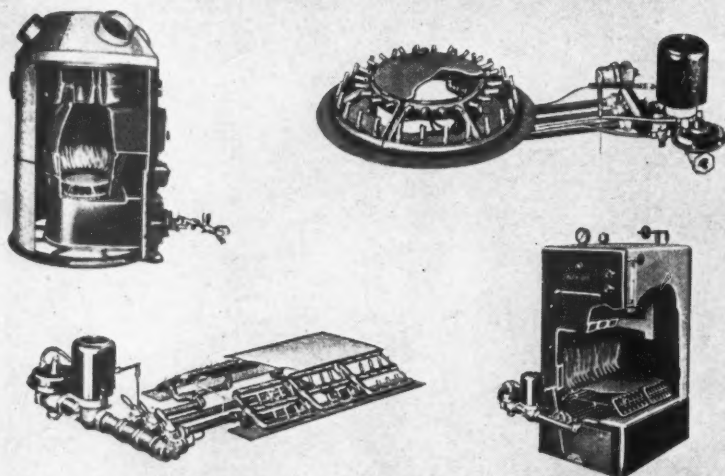
## "HEAT" RADIATING "FINS"

This exclusive and patented feature of VICTOR Deluxe Units provides many additional square feet of highly effective heating surface — keeps casings cooler and thus prevents wasteful overheating of the basement — increases heating capacity 20% or more — pleases your customers by insuring a more abundant supply of heat for all rooms at the same time that it cuts their fuel costs 1/5 or more. Heat Radiating Fins prolong the life of all VICTOR Deluxe Units and provide 8 great sales advantages for you. Write for details now.

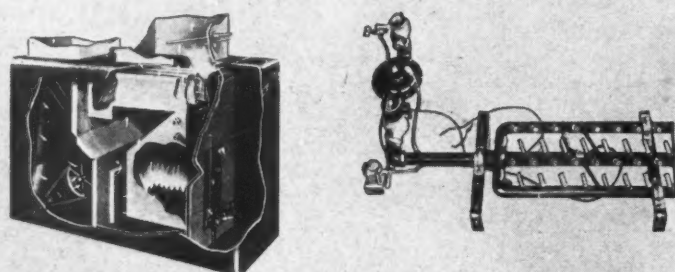
# HALL-NEAL FURNACE COMPANY

# BARBER UNITS *for Every Type* of **GAS APPLIANCE**

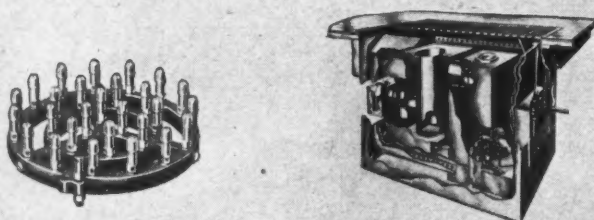
FOR CONVERSION JOBS—



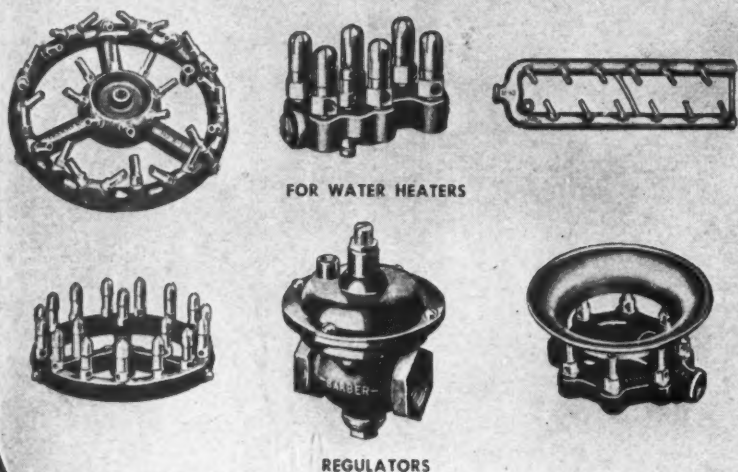
FOR AIR CONDITIONING EQUIPMENT—



FOR FLOOR FURNACES—



FOR ALL GAS APPLIANCES—



FOR WATER HEATERS

REGULATORS

Under the stress of national emergency, engineering resourcefulness in the gas appliance field is now at a greater premium than ever. With the necessity for conservation of every type of gas fuel, as well as materials for the manufacture of gas burning equipment, there has arisen a more imperative demand than ever before for **EFFICIENCY**.

For 1942 Barber offers, for gas appliances of every description, and for natural, manufactured, Butane, or bottled gas—the most economical, highly developed, dependable burner units in its history. The burner is the **HEART** of the appliance. The finest thing that can be said about any gas appliance is that it is Barber-equipped. Over 20 years of distinguished service to the gas appliance industry, and the adoption of Barber Burners as standard equipment by nearly 200 nationally known appliance makers, give added force to this statement.

On atmospheric pressure, patented Barber Burner Jets, with their unique auxiliary air feed, deliver a perfectly controlled, directed flame of 1900° temperature with complete fuel combustion. The secret of top performance in any gas-burning equipment is a **BARBER BURNER**.

Barber will design, under laboratory control, the proper type and size burner unit to suit your particular appliance. We are gas burner specialists, and offer you our engineering and plant facilities for the development and manufacture of burner units for your specific purposes. Write for new Catalog 42, illustrating and listing many types of burners for Appliances, Gas Burners for Furnaces and Boilers, Regulators, etc.

**THE BARBER GAS BURNER CO.**  
3704 Superior Avenue Cleveland, Ohio



## **BARBER** *Automatic* **JET GAS** **BURNERS**



# GET WISE...

## SELL A COMPLETE LINE!

The days ahead are going to be tough on business men, and the dealer with the most to offer will get the bulk of the heating business. With the WISE Line behind you, you're on the top rung . . . you have a size and style furnace or air conditioning unit for any home with clean, economical, efficient heat from either coal, oil or gas fired furnaces. The Wise Line starts with the famous Series "A" shown at the left. For many years this unit has been the ultimate in heating value, with such important features as the self-cleaning radiator, and cellular firepot helping you sell it to value-minded customers. Available for gravity or air conditioning.

### WISE OIL-FIRED FURNACES for GRAVITY or AIR CONDITIONING

Latest addition to the extensive WISE Line is the oil-fired air conditioning and gravity unit illustrated at right. It's designed in the modern trend, with pleasing color and streamlined casing. The utmost in economy and durability have been secured by equipping this unit with the latest type rotary wall flame burner. This, combined with immense heating surface providing long upward travel of the heat assures perfect safety and combustion. Tests have shown this unit to be highly efficient, free from the accumulation of soot and similar difficulties encountered in oil furnaces in the past. Truly a modern unit for the modern home!



### GAS-FIRED AIR CONDITIONING UNITS—REALLY AUTOMATIC HEAT!

To your customers who want the utmost in really automatic air conditioning you can show this WISE Gas-fired Air Conditioning unit which uses either the steel radiator of the all cast iron gas furnace as the heating element.

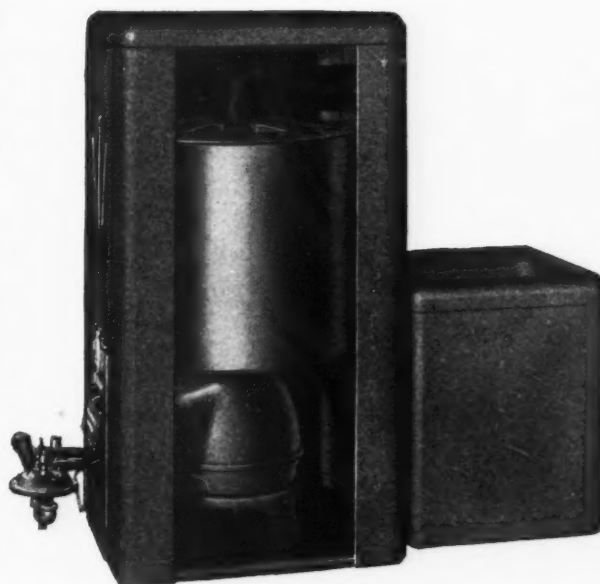
True air conditioning is at its best in this model. Well designed to give the utmost in efficiency and performance it will give you a decided edge on the competition and enable you to build up a business that will repay you handsomely.

Literature is available on the entire line. Better write for it today. We'll send it by return mail.

## THE WISE FURNACE COMPANY

AKRON

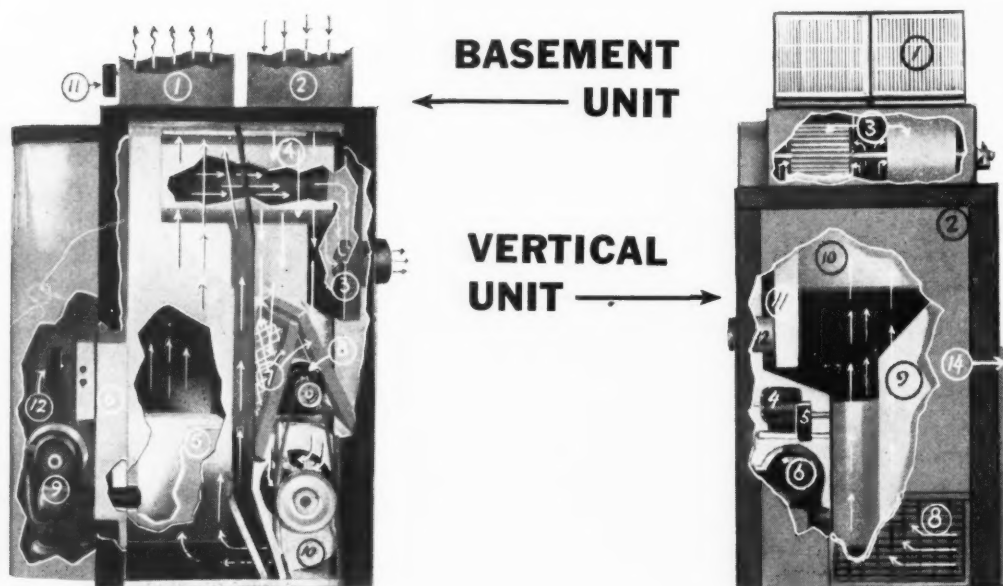
OHIO





# SUN FUEL-MASTER AUTOMATIC FURNACES

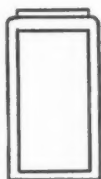
*With High Pressure Oil Burners*



**2 TYPES**

**8 SIZES**

**60,000 Btu to 400,000 Btu**



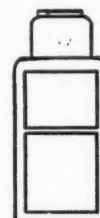
Basement Units employ counterflow principle of heat transfer. Vent outlet and cleanouts at rear. Blower-filter assembly mounts under economizer assembly. Burner in full vestibule.

Utility Room Units employ pull-through principle of heat transfer. Blowers are top-mounted and return air is taken at floor level. Burner installs under econo-



mizer assembly. Vent outlet and cleanout in front of unit. Adaptable to closet installations.

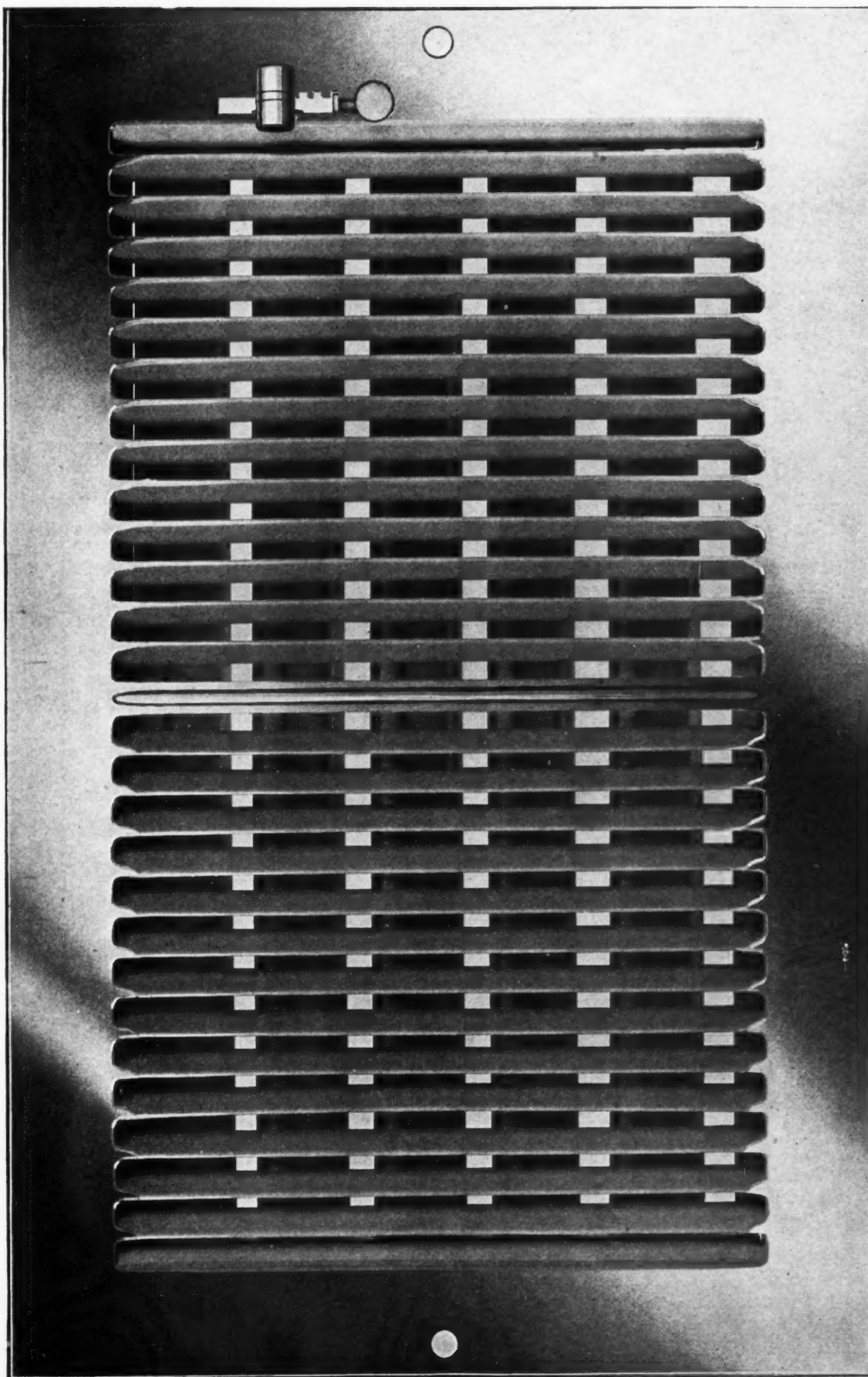
Space Heater Units same as Utility Room Type with added reversible outlet turrets and directional flow air conditioning grilles. Entire unit self-contained including thermostat.



## J. V. PATTEN CO., INC.

215 DeKALB AVENUE

SYCAMORE, ILLINOIS



## THE BIG VALUE IN REGISTERS . . . THE PLIAVANE

A register with individually adjustable face bars, shown in the multi-valve Adjustiblade Construction which allows horizontal and vertical deflection of the air stream at the same time. Also available with horizontal adjustable face bars and single valve damper. Strong — modern, efficient and surprisingly inexpensive.



**TUTTLE & BAILEY, Inc.**  
New Britain, Conn.

NEW YORK CHICAGO PHILADELPHIA HOUSTON

# "Packaged" Heating Plants

made Economical, Dependable for  
Defense Home Builders *with*

**A-P** **DEPENDABLE**  
*Oil Control Valves..*

Today, Defense housing must be more than a shell and a shelter. . . For the health of Millions of Defense Workers — "Soldiers behind the lines" — is just as important as the health of our soldiers on the battle fronts. And these thousands of new, low cost homes must be built for permanent comfort, protection also of growing young Americans of tomorrow.

American Manufacturers of Heating Plants have successfully met this need for low cost, DEPENDABLE Heating in modern "Packaged" units, inexpensive, easy to install, efficient, long-lasting. And above all, they're built for trouble-free heating, and the all-important FUEL ECONOMY — with A-P DEPENDABLE OIL CONTROL VALVES!

A-P Engineers, skilled in Oil Control problems, have had most of these modern units on test in the A-P research laboratories . . . YOUR assurance of DEPENDABLE heat and FUEL ECONOMY, is therefore, the A-P DEPENDABLE OIL CONTROL VALVE on the Heating Units you sell and install.

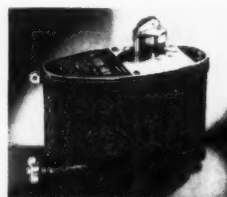
## To Manufacturers:

A-P welcomes YOUR control problems — and promises a solution that will be both profitable and economical.

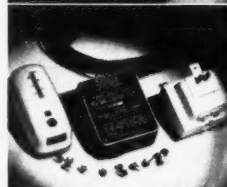
★  
**AUTOMATIC PRODUCTS COMPANY**  
2452 NORTH THIRTY — SECOND STREET  
MILWAUKEE WISCONSIN  
★



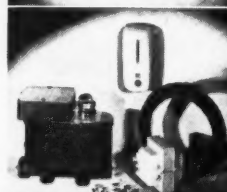
Look for These A-P DEPENDABLE CONTROLS on Your Defense Heating Units.



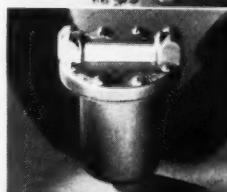
A-P Constant Level Oil Control with Fuel Compensator.



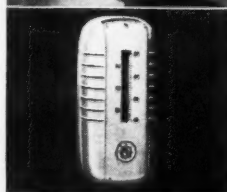
A-P Thermostatic Heat Regulator Set with Fan Switch.



A-P Complete Furnace Control Sets for all types of Gravity Oil Burning Furnaces.



A-P Fuel Oil "Trap-It" Traps water and foreign deposits.



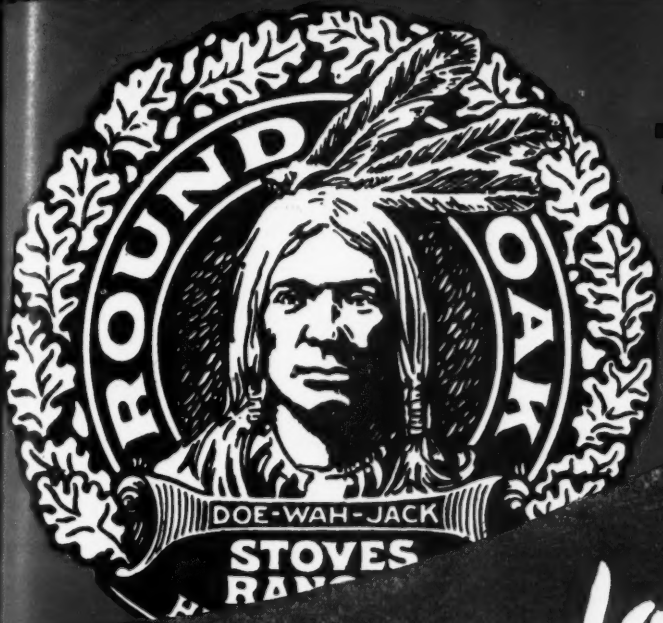
A-P Thermostat with "Heat Anticipator."



**DEPENDABLE**

*Oil Control Valves..*





FOR  
71 YEARS...

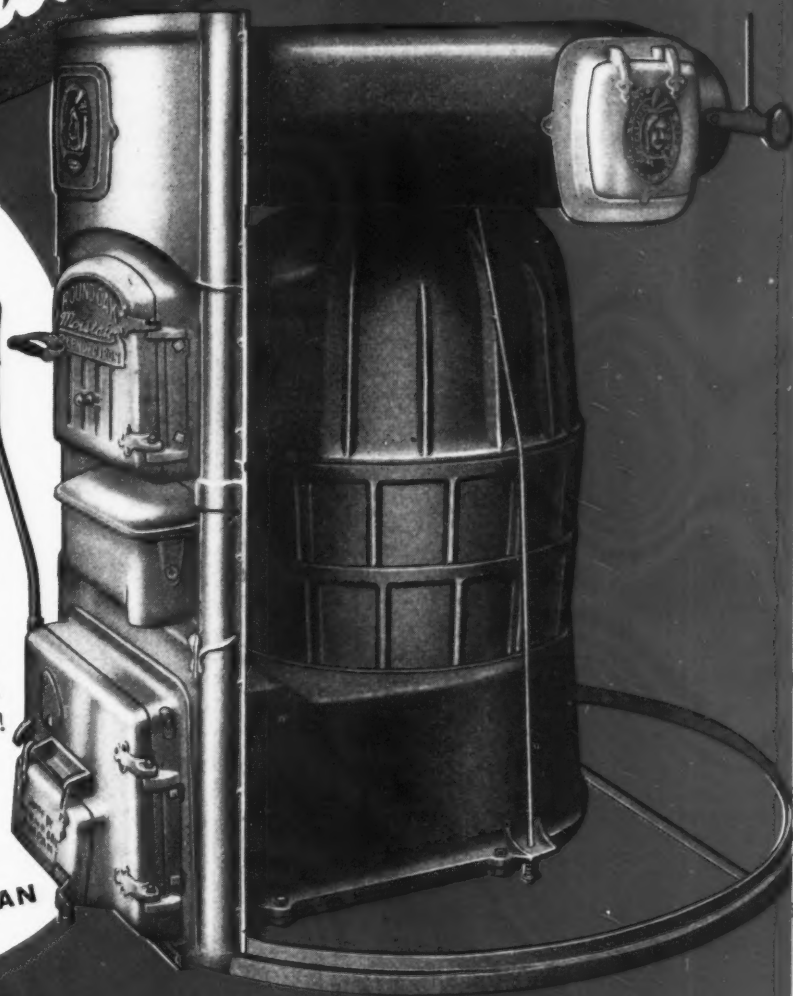
# The Standard of Heating Value

Round Oak is also doing its part in supplying essential materials for national defense

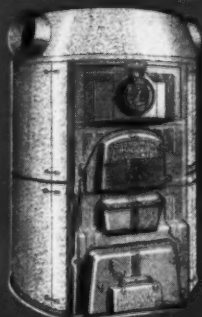
**T**HE Round Oak dealer is usually the oldest, most stable, in the community...for his business is built on the sturdy foundation of highest quality heating equipment, reinforced by the reputation for honest values which Round Oak products have held since 1871. His customers know that they can count on more than their money's worth from a Round Oak Furnace...regardless of price. That's confidence, the most important sales feature.

Take advantage of everything Round Oak has to offer for 1942, and you, too, will be fully equipped to cover the entire warm air field...in both the new construction and replacement markets. Cash in on Round Oak's name...the standard of heating value!

WRITE FOR CATALOG  
**ROUND OAK CO.**  
DOWAGIAC MICHIGAN



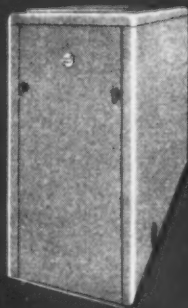
COAL, OIL, AND GAS FURNACES—MANUAL OR AUTOMATIC



Moister Mended-iron Gravity Furnace... low in cost and leader in the big-volume market of today.



SPK Stoker Furnace and Air Conditioner. Extensions on either side for any standard boiler.



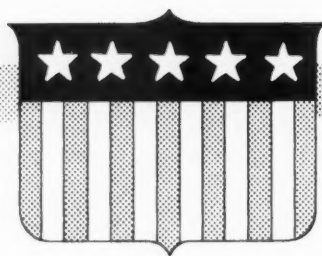
XB Oil Furnace performs all functions of heating and air conditioning. Complete with burner.



Gas Fired Winter Air Conditioner. A compact automatic unit for utility room installation.



S Boiler-Plate Furnace—electrically arc welded for longer life, and dependable service.



We of AIR CONTROL PRODUCTS, INC. are proud to announce that our new plant at Coopersville, Michigan, with twice the floor space of our Muskegon Plant, is now in operation, providing increased capacity for to-day's greater defense responsibilities. We also want to help our customers do their part in the defense program by providing them with the best possible heating and ventilating equipment that is so essential to our armed forces and our civilian population.

**The AIR CONTROL Program for 1942—**

- A. Precision AIRCRAFT PARTS, etc., for the  
U. S. Army and Navy**
- B. A complete line of REGISTERS, GRILLES, DAMPER  
CONTROL SETS, ATTIC LOUVERS for**  
**Cantonments**  
**Air Fields, Naval Bases, Hospitals**  
**America's New Housing Needs**  
**Rehabilitation and Repair Needs**

We of AIR CONTROL have a dual responsibility—to do our part in winning this war, and to supply our customers and their customers with our usual high quality and prompt service. We hope that in fulfilling these obligations we will maintain your good will long after Victory is achieved.

*Write to-day for complete information on the AIR CONTROL Line  
—the accepted Line for America's Defense and Civilian requirements.*

***Air Control Products, Inc.*** **COOPERSVILLE  
MICHIGAN**

# BARD

# DEALERS Make Money!

They are satisfied because their customers are satisfied.

## DEALER POLICY

Established years ago, the Bard policy of square dealing, living up to promises on delivery, territory protection and honest quality has created real loyalty among dealers. This policy will be continued.



## THE BARD GUARANTEE

The Guarantee on every Bard Heating Unit means just exactly what it says and is backed up 100%—We assume full responsibility for quality of material and workmanship. No alibis.



## MODERN DESIGN HIGH EFFICIENCY

Bard Units "stay sold" because they work better. The owners are satisfied, fuel bills lower. That is due to the careful engineering and controlled manufacture of these units.

"Bard Units Cost Less To Own"

## THE RIGHT UNIT FOR EVERY JOB

OIL FIRED UNITS from 80,000 to 400,000 Btu.

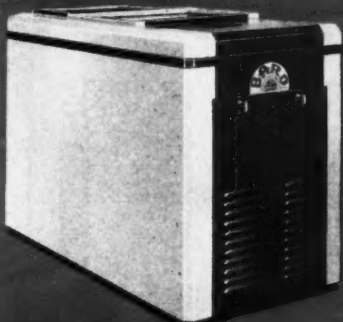
GAS FIRED UNITS from 90,000 to 240,000 Btu.

Completely automatic winter air-conditioning for domestic and commercial installations. Every unit priced to "pay you in" at a profit on the competitive deals.

Some good territory is still open. Write for the Bard Dealer Proposition . . . carries a profit for you."

**BARD MANUFACTURING COMPANY, BRYAN, OHIO**

# THE BARD LINE IS COMPLETE



Model C-1



Model G-1



Model 80P



Model G80

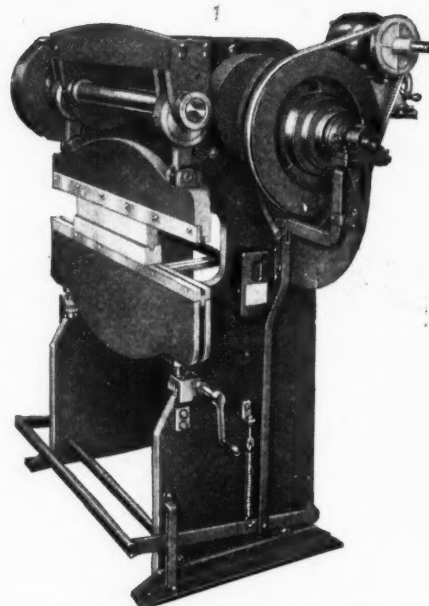


Model N8-1

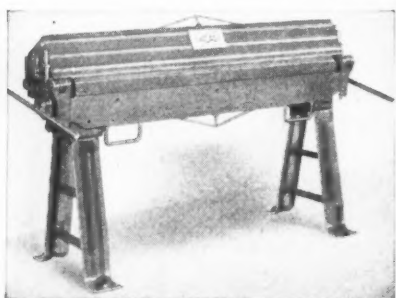


# ALL DEFENSE INDUSTRIES *are using* CHICAGO EQUIPMENT

Thousands of Chicago Brakes have been furnished to the Army, Navy, Defense Training Schools, Airplane Factories and wherever sheet metal is used in defense industries. Increased capacities enable us to make prompt deliveries on all machines—production has been greatly increased to meet defense demands. Illustrated at right is the Chicago Steel Press No. 253. This is a 48", No. 14 gauge capacity brake ideally suited for quickly and economically forming the metal sections necessary on so many of your defense orders. Variable speed drive operates from 17 to 50 strokes per minute. Made in 40 larger sizes up to 16 ft. to bend  $\frac{1}{2}$ " plate.



**CHICAGO STEEL PRESS  
NUMBER TWO FIFTY THREE**



## CHICAGO STEEL BRAKE

This is a versatile brake manufactured for any and all types of bending. Made in 35 standard sizes to suit the needs of sheet metal contractors desiring quick, dependable work.

Special brakes for difficult jobs are also built with the usual D & K consistency of quality. Let us show you how D & K equipment can save you time, money and worry.



## PORTABLE CHICAGO STEEL BENDING BRAKE

This portable brake was built to fill a definite need in air conditioning work—will bend and flatten  $\frac{1}{4}$ " flange or wider on 20 gauge — half the weight of regular brake, perfect for use on small or large jobs and ideal for general shop use. Legs swing up and make very compact piece to carry to the job. Clamping handles are made to be used for carrying. Top and bottom sections of one-piece em-

bossed steel plates for greater strength with minimum weight. Bending lead is a solid plate reinforced with specially formed plate. One man can set it up by bringing hinged legs to upright position and locking with convenient thumb screws. Two men can carry it. No loose parts to mislay. Brake always remains firmly in place without bolting to floor.

*Write Today for Literature!*

**DREIS & KRUMP MANUFACTURING CO.**  
7404 LOOMIS BOULEVARD  
CHICAGO, ILLINOIS

# LEADING THE FIELD

## AND WHY?

*Why is **WALKER** the World's Largest Exclusive Manufacturer of Automatic Draft Controls?*

When you sell Walker Automatic Draft Regulators, you are representing the largest exclusive manufacturer of fine draft controls in the world—a company with unsurpassed facilities for turning out a superior product. Walker is in only one business—that of making quality draft controls for household and industrial use. Add Walker Automatic Draft Controls to your line, and your profits will go up.

*Commercial and Industrial Fuel Saver Draft Regulator*

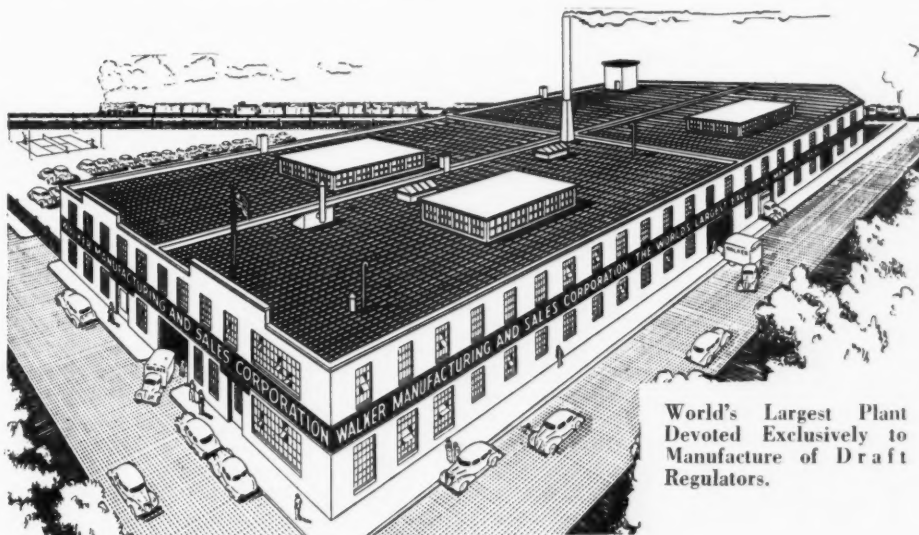


Walker makes a full line of industrial controls. Sizes 16" to 36", inclusive, made of heavy cast ring with deep-drawn flanged steel plate with adjustable ball-bearing construction. For use with the heaviest drafts and any kind of fuel.

**A PROFITABLE ADDITION TO YOUR LINE**

Install a Walker Automatic Draft Regulator on every heating unit you sell. The results will be greater economy, better performance, more customer satisfaction—and increased sales for you. Walker controls are easy to sell, easy to install and the cost is low. Write today for full information.

*All Walker Products are listed as standard by the Underwriters' Laboratories.*



**World's Largest Plant Devoted Exclusively to Manufacture of Draft Regulators.**

## REASON NO. 2

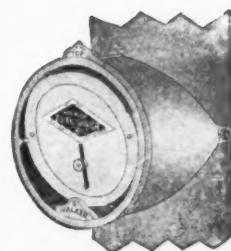
# WALKER AUTOMATIC DRAFT REGULATORS

*are Superior*



**WALKER FUEL SAVER, TYPE 34-B AND 34-C WITH STOVE PIPE TEE JOINT**  
More than 2,500,000 units of these famous WALKER Regulators have been installed for the fuel users of America. Furnished in sizes 3" to 9" inclusive, in blue, chrome or cadmium and packed in individual cartons or bulk.

Walker Fuel Saver Type No. 34, at the right, maintains proper draft regulations under all conditions for furnace, boiler, stove or hot water heater. Domestic sizes 4" to 20", inclusive, furnished with or without collar, in either Galvanized metal or Cadmium Plated finish.



**WALKER MANUFACTURING & SALES CORP.**

**1714 PENN ST.  
ST. JOSEPH, MO.**

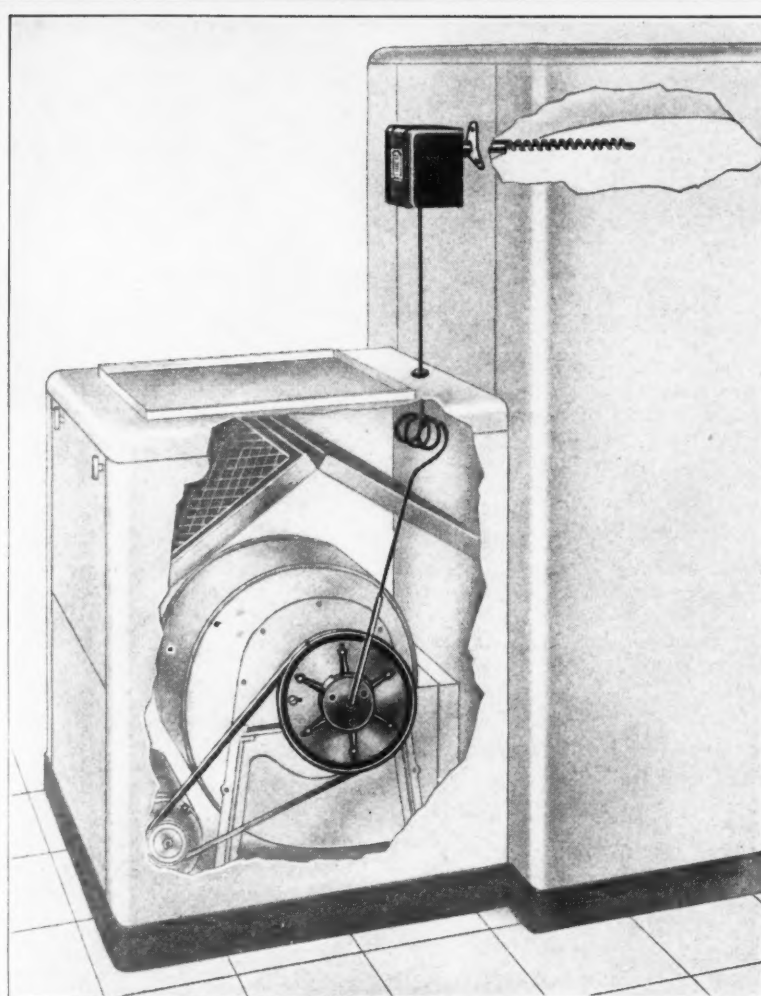
# MASTER BLOWERTROL

*Thermostatic* **BLOWER CONTROL**

**One of the most  
Important Improvements in  
Warm Air Heating offered  
in the last Decade!**

First announced last May, the **MASTER BLOWERTROL**, after thorough tests, has been enthusiastically acclaimed by many heating engineers, contractors, dealers and furnace manufacturers.

Designed to make **FORCED-AIR HEATING** more acceptable and pleasing to home owners, it automatically regulates the blower speed in direct ratio to the bonnet temperature of the furnace or heating unit.



This steady, smooth, quiet, gradual-speed **BLOWERTROL** operation (shown by chart above) does away with chilling blasts, air stratification, hot blasts, "cold 70°", cold drafts, blower starting noise and excessive strain on the blower motor. It assures more constant and healthful air circulation, more uniform and *comfortable* room temperature and fuel economy.

**BLOWERTROL** is simple in construction, automatic and dependable in operation, soundly engineered, thoroughly tested and proved in actual home service operation. It is adaptable to any forced-air heating system using a centrifugal blower, regardless of fuel used—to new or old installations—and as factory equipment.

**MODERATE COST**—priced well within the means of the small home owner.

**WRITE FOR BULLETIN**—giving full information, details of construction and operation.

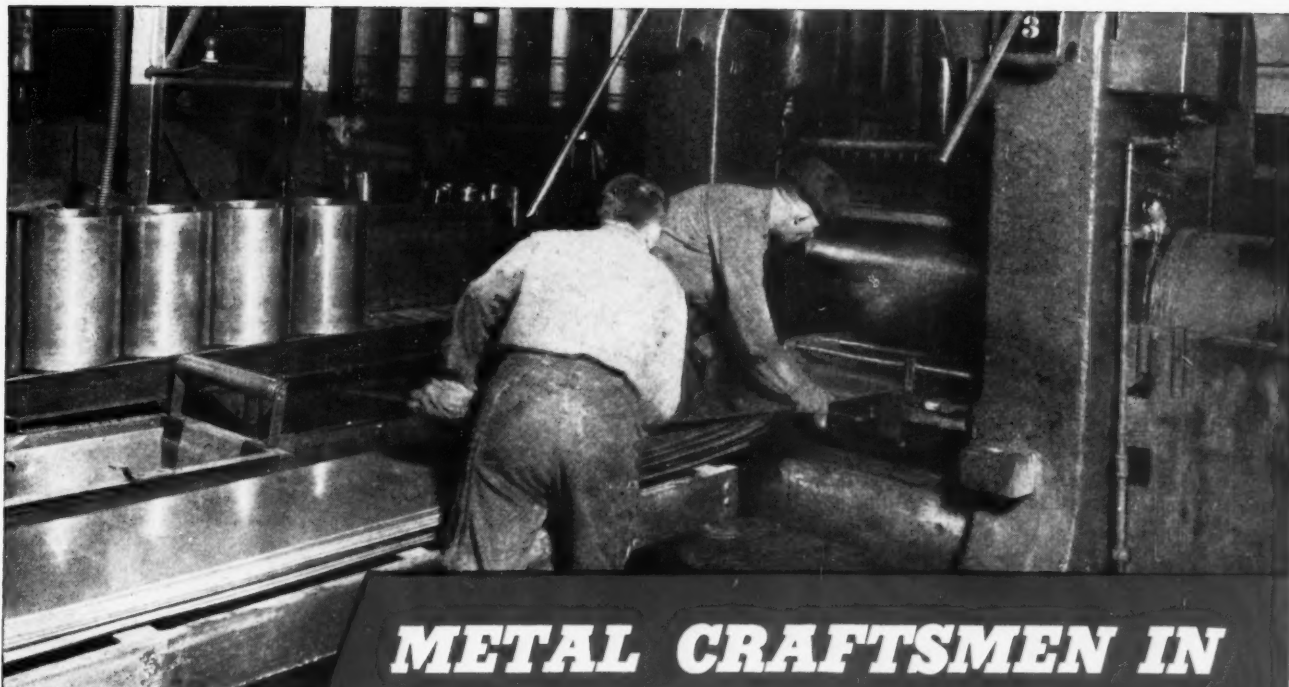
## MASTER HEAT REGULATOR

*Type P-23*—Includes accurate, dependable snap-action Thermostat—Damper motor—Transformer and accessories. Popular priced—long life—trouble-free operation. Write for bulletin.



**WHITE MANUFACTURING CO.** 2364 University Ave., St. Paul, Minn.





## **METAL CRAFTSMEN IN DEFENSE INDUSTRIES**

# Know and Prefer **HUSSEY** Pure Lake **COPPER**

The Trade's preference for Hussey Copper keeps growing because its superior workability, uniformly dependable quality and unusual durability are *inherent* properties . . . always present . . . always reliable. Here's the reason! Hussey Copper is *Pure Lake Copper*, smelted from rich Great Lake deposits and refined so that all its *natural* characteristics are retained.

To you, the craftsmen, and to Defense Production, Hussey *Pure Lake Copper* always means a rich, full-bodied, *natural* copper that works readily, assures strength, stamina and ductility of the highest order, resists season-cracking and provides the endurance that only *natural* copper can give. Craftsmen and Defense Industries alike know and prefer Hussey *Pure Lake Copper*.

### **C. G. HUSSEY & COMPANY**

(Division of Copper Range Co.)

Miners and Refiners of *Pure Lake Copper*  
Rolling Mills and General Offices: **PITTSBURGH, PA.**

*Copper*

**HUSSEY**

*Brass*

*Thanks . . . . .*

FOR YOUR HELP  
IN MAKING 1941  
THE *biggest year*  
IN OUR HISTORY

MINNEAPOLIS-HONEYWELL  
REGULATOR COMPANY

*P.S.* For the fourth successive year Minneapolis-Honeywell sales of controls for the automatic heating industry reached a new high. In addition, the facilities of M-H were actively engaged in supplying vital products and materiel for defense.



## Something To Sink Our Teeth In

**W**E HAVE, as an industry, just closed our books on one of the busiest years in memory. Most of us have done more business—by dollar volume or unit sales—than in any twelve months since 1929.

And we have completed this "big" year in spite of a confusion unparalleled in the experience of this generation. We have done our job in the midst of headaches of real or feared scarcities; in the face of labor problems of the first order; to the tune of orders, regulations, restrictions, and just plain blah from Washington.

And while we have each solved his problem as best we can, we have had one ear and one eye tuned to world events which we have felt sure would, sooner or later, make 1941 headaches only a dim memory.

Now, in the first month of 1942, we find 1941 already is a dim memory—made so by the intangible events to come that we can only guess at. About all we know for sure is that our country is at war. That as patriotic citizens we will and must do our part, as best we can, no matter what the result may be on our personal and business life.

If only there was something to sink our teeth in! However, there's nothing cut and dried, proved and accepted, reduced to theory or rule—in the coming events. The whole world is being opportunist; cutting and fitting as it goes along,

hoping to work out a resultful pattern. Our industry can only do the same.

Well within the realms of possibility are a few hard facts which augur for an active 1942.

On the next two pages, for example, the officials heading up Federal agencies assigned the task of providing shelter for the millions of workers who are congregating for defense work in defense areas foresee a need for at least 550,000 new housing units in 1942. Granting that these will be multi-family buildings in part and small single houses in the main—this demand presages a large furnace year. Particularly significant is the fact that private industry is counted on for 425,000 of these new units.

The pattern is already set. For the multi-family structures AMERICAN ARTISAN's study of four public housing projects beginning on page 99 illustrates clearly what will be done in 1942. For the single family houses the series of articles begun in the August, 1941 issue under the title "Defense House Heating" will cover every possible angle of the problem of heating very small houses efficiently, satisfactorily, frugally.

This tremendous new housing program, big as it is, cannot hope to meet all the demands for housing. There must be a greatly enlarged program of remodeling, reconstruction, alteration to existing buildings to create additional housing

(Continued on page 188)

### Announcement

This issue of AMERICAN ARTISAN started out to be the January 1942 Directory and Show Number, the "Show" referring to the 7th International Heating and Ventilating Exposition which had been scheduled for Philadelphia, January 26-30, the same week as that of the meeting of the National Warm Air Heating and Air Conditioning Association. It ends up as the January 1942 Directory Number. Just before going to press word was received that the Exposition had been postponed (see official statement of the Exposition management on page 96). Thus, at the last minute, the editorial preview of the Expo-

sition, with lists of exhibitors, exhibit hall layout and other features relating to it, was "killed." The issue, we believe, speaks for itself as to its value without the Show feature.

Please note that the calling off of the Show does not affect the holding of the 28th Annual Convention of the Warm Air Heating and Air Conditioning Association. It will proceed in Philadelphia as originally planned. Statement relative to this from George Boeddener, managing director of the association, and the program of the meeting will be found on page 96.—Editor.



# Adequate Housing Is a "Key" Defense Need

## *1942 Should Be a 550,000 New House Year*

Why, When, How is clearly explained  
in the following statements prepared  
for American Artisan by the chiefs of  
Federal Housing Construction Agencies

### DIVISION OF DEFENSE HOUSING COORDINATION

Office for Emergency Management

By Charles F. Palmer,  
Coordinator of Defense Housing

RECENT estimates of the Defense Housing Coordinator's Office indicate a need for at least 550,000 new family dwellings for war workers during the 1942 fiscal year. It is hoped that private enterprise will build 400,000 of that number, leaving 150,000 to be constructed with public funds.

This housing will be added to the 400,000 family dwellings under construction by private enterprise for defense workers in 1941 and the 106,412 homes for which contracts have been let by the Government. Public war housing projects numbering over 400 are in various stages of completion in 178 localities distributed throughout 50 states and territories. These homes are being built for civilian employees in private defense industry, civilian industrial workers in Government plants, and enlisted and civilian personnel of the Army and Navy. Some 11,000 units for single workers were also provided for during the last year. Programs have been drawn up covering approximately 19,000 family dwellings for which funds are not yet available.

A recent appropriation makes available to the President \$300,000,000 for temporary shelter in localities where shelter is urgently needed for housing of war workers. Under previous appropriations totalling \$20,000,000 for this purpose, funds have been allocated for more than 8700 trailers and portable cottages. One of the advantages of this type of shelter is that it can be moved out of a locality as permanent housing is completed and moved to a new community where the need is urgent.

Also possible under the new legislation is the con-  
(Continued on page 189)

### FEDERAL WORKS ADMINISTRATION

By Brig.-Gen. Philip B. Fleming  
Federal Works Administrator

THE importance of housing for our war workers cannot be exaggerated. In hundreds of cities and towns are located plants which are contributing directly and importantly to America's war preparation.

The production of these vital materials must remain unhampered by lack of housing or intolerable housing conditions.

Lack of adequate housing facilities in the vicinity of industrial plants has in some cases forced workers to live in crowded, unsafe structures which often contain inadequate heating equipment and sanitary facilities. In many cases several families have been forced to share a single small house, which often was in disrepair. Another evil which requires correction is that of long distance commuting which results from many families being unable to obtain accommodations within reasonable distance of factories and workshops.

The type of housing being made available by the FWA defense housing program—some 50,000 homes completed thus far, out of a total of 90,000 in progress—is providing for workers the fundamentals of decent living and is doing so at a rental well within the range of the moderate income war worker.

The completion of defense housing projects is being pushed rapidly, but even more speed is necessary. Defense housing, defense public works, and defense roads are now war programs. Production must be put upon a maximum basis at once. Every organization in the Federal Works Agency, every contractor and worker on FWA projects, and every employee of FWA in and outside of Washington has been urged to do everything within human power to speed construction, to speed contracts and to speed to the earliest possible completion the facilities that are so critically needed.

### FEDERAL HOUSING ADMINISTRATION

By Abner H. Ferguson  
Federal Housing Administrator

IN MANY defense areas, large segments of the market for defense housing consist of defense workers who desire to rent accommodations rather than to purchase them. Furthermore, large numbers of the workers seeking rental accommodations are able to pay economic rents. Consequently, the importance of increased participation by private enterprise in meeting this need for new rental dwellings in defense areas is becoming more and more apparent.

The Federal Housing Administration is now launching a strong effort to increase the construction of privately financed rental accommodations for defense workers under the provisions of Title VI of the National Housing Act. By permitting the insurance

of 90-percent mortgages to builder-mortgagors, Title VI offers the most liberal financing medium for rental construction that has ever been available in the rental field.

Title VI provides a ready financing vehicle for such activity. The procedures established by the Office of Production Management for priorities assistance in the construction of privately financed defense housing provide a higher priorities rating for new dwellings built for rental purposes than for dwellings constructed for sale. Furthermore, long-term real estate investments are becoming increasingly attractive from the standpoint of taxation, inasmuch as the profits from and accompanying tax liability on houses built and held for rental are spread over a period of years rather than concentrated in a single transaction as in the case of properties built for sale.

In order to develop the quickest possible expansion  
(Continued on page 189)

## PUBLIC BUILDINGS ADMINISTRATION

By W. E. Reynolds

Commissioner of Public Buildings

**P**UBLIC BUILDINGS ADMINISTRATION has been assigned the task of constructing 158 defense housing projects located in 38 states, Hawaii and Puerto Rico, offering more than 35,000 new homes for Army and Navy personnel and industrial defense workers.

Project specifications call for heating systems in all but thirteen of the projects, these being in Hawaii, Puerto Rico, and southern Florida.

On all of the projects, PBA engineers made complete analyses of the heating needs, resulting in the choice of equipment and the type of fuel used. Separate analyses were based on the types of construction and insulation used; the length of the heating season; the high, low and average temperatures; availability, and cost were also considered. As a result of the analyses, PBA engineers indicated that coal would be used for heating some 15,000 defense homes, gas in approximately 14,500 and oil in some 3,500. For more than 2,000 homes in tropical climates, heating units have not been installed.

The Public Buildings Administration has contracted with manufacturers for over one and one-half million dollars worth of heating units. The Procurement Division of the Treasury aided in the placement of the majority of these orders.

PBA was confronted with the problem of reducing construction items to a minimum, not losing sight of the fact that the houses had to provide suitable living quarters with reasonably modern conveniences for the tenants. This was due to the fact that all of the acts passed by the Congress involving the construction of  
(Continued on page 189)

## UNITED STATES HOUSING AUTHORITY

By Nathan Straus

Administrator

**T**HE war into which the United States has been forced has served to highlight our great need for new housing for families which live under bad housing conditions. There is no escape from the fact

that to get the utmost in efficiency and cooperation from our people, they must be properly housed.

The experience of the USHA in slum clearance housing has proven that the task of building housing for low-income families could best be entrusted to the initiative, enterprise, and control of local public bodies which needed only the Federal Government's technical and financial assistance to attack the problem. Within 125 days of the passage of the Act authorizing USHA to build defense housing, 2 projects were open for occupancy. Today there are 106 defense projects with 29,345 homes under construction or completed, 18 months after USHA and the local authorities' defense housing machinery got started.

USHA's record of construction cost-reduction is impressive. Built by labor paid prevailing wages, following normal industrial relationships in the particular community, the USHA-local authority slum clearance projects are simple and durable permanent structures.

For 739 USHA-aided projects, the estimated average net construction cost per dwelling unit was only \$2,698 as of December 15, 1941. Competitive bidding practices and successful labor relations, which have eliminated costly stoppages, are two factors in the lowered costs. Intelligent planning, new methods of construction, prudent land-acquisition practices, elimination of frills and gadgets, large-scale purchasing, and standardization of parts are other factors in the lowered costs.

Even in the midst of the war we have a responsibility  
(Continued on page 193)

## U. S. DEPARTMENT OF AGRICULTURE FARM SECURITY ADMINISTRATION

By Shelby Thompson

Acting Ass't Chief, Information Division

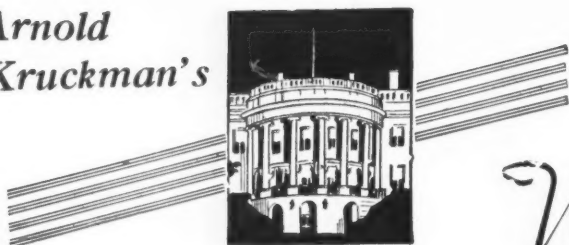
**I**T HAS long been known that there is an acute need for better rural housing. Two difficulties have made it hard to measure this need: (1) There has been no recognized standard of minimum requirements in rural housing; (2) there has been a lack of information about the condition of farm homes.

One estimate of the need for improved rural housing, on a national scale, is that supplied by the Farm Housing Survey, which showed that some 697,000 farmhouses were beyond repair in 1934. To relieve over-crowding, the occupants of all the farmhouses covered in the Survey needed more than 4,000,000 additional rooms, including bathrooms and basements.

A report concerning the need for rural housing was made in October, 1941, by the USDA Interbureau Coordinating Committee on Post-Defense programs. This report says, in part:

"The reports so far available from the 1940 Census indicate that the estimate for farm homes in urgent need of replacement is greater than 1,000,000 since the need for repair has apparently grown worse. . . Using minimum requirements for a farm dwelling outlined by the Department of Agriculture, and including the needs of migrants, at least two to three million new farm homes are urgently needed. It should be repeated that these requirements, and this estimate, are based on rock-bottom considerations of health and decency."

Where is housing needed? The report mentioned  
(Continued on page 190)



## Washington Letter

### Our Immediate Housing Needs

GOVERNMENT officials always are cautious about prognostications. At present, when men and events change from hour to hour, they are particularly careful about predictions. What is true today may be deader than last week's newspaper tomorrow. Forecasts herein should be read with some such reservation in mind.

#### 550,000 New Homes Needed Now

The consensus is that the immediate need of housing is 550,000 units. These are housing units *for which no actual provision has yet been made*, at this writing. As will appear later there are under way active preparations which will start the machinery of construction probably before this is published.

These 550,000 needed housing units *are in addition to* the 506,412 homes either completed, under construction, or under actual contract to be constructed, as part of the 1941 defense housing program. In addition, during 1941, 110,000 family dwellings have been built in non-defense areas. The grand total for all areas, defense and non-defense, in 1941, is 616,000 homes, 14% more than 1940. The greatest increase was in the East North Central States, the Pacific Coast States, and the South Atlantic States. The States in the Rocky Mountain area built less homes. Small cities and towns everywhere built far more new homes than the big cities. Government built most of its projects in the smaller towns and cities.

#### Housing Restricted to Critical Areas

All pending, planned or prospective housing is to be built in the 312 "critical defense areas" already designated by the President, and in other "critical defense areas" yet to be specified. Today, actual places and locations for any War activities may be mentioned only after the plans become active parts of the national and War economy. We may do some guessing by bearing in mind that there will be much new War business along all Coasts; and that duplicate facilities will be established in the area West of the Mississippi River and East of the Rocky Mountains. New plants will be paralleled by housing construction activities in the area between the Rockies and the Sierra Nevada ranges which run along the Pacific Coast. The Southwest will have developments.

Many new areas and new war industries will be located at places where today there is not even a post office. The yardstick for locations consists of nearness to raw materials, to arteries of transportation (which may be water, trucks, railroads, airways, probably all three); and proximity to abundant power or fuel, to plenty of water; and to sources which will help supply workers.

More or less in the order named, the new housing chiefly will be located where shipyards either are being newly established or expanded; at all ports and especially at superloading ports; and at areas where refineries either are coming into being or are in process of further development. It is certain over 50 new cantonments will come into existence as swiftly as they can be built, at least one to every State. There will be new Navy shore facilities, with housing.

#### 5 Million Army Means Houses

Existing Army cantonments and permanent Army Posts will be enlarged to accommodate more men—and their families. Remember, the Army is to be expanded to something like 5,000,000 or 6,000,000 men. At least another 250 airfields will be built and they will need contiguous housing facilities. Both Army and Navy are building arsenals, ordnance depots, and similar establishments; and many new factories of all kinds needed for War production either directly or indirectly, will be constructed as fast as possible.

At fast as possible the workers at existing plants will be placed on 3 to 4 shifts daily. The speed with which the 24-hour schedule may be put into operation depends upon the speed with which new housing can be erected. In most places they cannot employ more workers until they have more dwellings to shelter them. And finally, it is planned promptly to build communities to receive those who may have to be evacuated from areas where they now live, if and when the areas where they now live are attacked by the enemies.

#### Defense Workers Now Badly Housed

There is urgent need for shelter for defense workers. In many places several families are crowded in homes not over-large for one family. Often workers are obliged to commute great distances.

Federal Works Agency, directed by Brig.-Gen. Philip B. Fleming, through its various constituent parts, is the principal actual builder of defense housing. It does its building through Public Buildings Administration, Division of Defense Housing, Mutual Ownership Defense Housing Division, and the United States Housing Authority. The Defense Housing Division came into existence, as part of the FWA, as a board of review and control for defense housing built by FWA agencies. Its original purpose was to pass in judgment on the plans of Public Buildings Administration in order to prevent duplication and trespass upon the field of the United States Housing Authority. And to achieve the same result by reviewing the plans of the USHA.

Another PBA function was to standardize all such



equipment as lighting, screens, garbage receptacles, heating, plumbing installations, and similar furnishings of homes. Also it was designed to give employment to outstanding architects and engineers, in the interest of variety in defense housing. Eventually, in addition to coordination, it also was charged with responsibility for management of the houses built by FWA and owned by the Government.

Finally PBA took over some building on its own account through Mutual Ownership Defense Housing Division which, like Defense Housing Division, builds dwellings identical in all details of plan and program to those built by PBA. The separate slant of the Mutual organization is its effort to provide for those who rent or buy its homes a participation in the ownership of the units in a group.

United States Housing Authority, headed by Nathan Straus, was created to help States and cities and towns to remedy unsafe and insanitary housing conditions and to clean up slums by providing dwellings for families of low incomes. Broadly speaking, USHA furnishes a similar type of dwelling in the defense housing program.

#### Army-Navy Contract Procedure

It is essential to understand this situation to appreciate the intricate defense housing picture. Housing for the Army and the Navy, outside of the regular permanent Posts and Reservations, is built by the FWA agencies within the cost limits indicated. Housing built inside the permanent Army Posts and Navy Reservations usually is more expensive, material is better and homes are larger, than the so-called defense housing. The permanent Army housing is now built by the Construction Division of the Corps of Engineers whose District Offices are scattered fairly numerous around the country. Navy housing comes under Lieut. J. J. Mosely, assisted by the civilian attache George Knox in Washington, D. C. Permanent Reservation housing is built under supervision of the Navy Bureau of Yards and Docks, or the Navy Bureau of Supplies and Accounts, whose offices are scattered widely around the United States.

Normally Army and Navy contracts are awarded to the lowest bidders. The contractors usually procure the heating equipment and install it. But recently, under the War Powers Act, the President issued an Executive Order suspending the need for competitive bidding. Under the Order, contracts will be negotiated directly on the cost-plus-a-fixed-fee basis; and apparently it is intended that all profits shall be computed on the basis of 7%. Under this Order the Army and Navy and presumably other agencies constructing, building, or manufacturing and selling services for defense or war needs, are expected to purchase equipment, such as heating installations, direct from the manufacturers.

#### Procurement May Mass-Buy for Army-Navy

The Army and the Navy, like the FWA, will buy its supplies through the Procurement Division of the Treasury Department. Apparently, but not yet definitely, it appears likely that 7% profits limitation will apply to all things, materials, equipment, and services procured for defense or war purposes. Executive Order 9001 directs the Army, the Navy, and the U. S. Maritime Commission, to make contracts, payments, advances, without regard to provisions of laws relating to contracts. It covers all forms of contracts for all kinds of things and services. It gives authority

to amend and modify contracts, settle claims, waive advertising to invite bids, to set aside competitive bidding, to set aside payment, performance and other bonds and securities. It prohibits commissions, percentages, brokerage fees, contingent fees, except through established agencies maintained by the contractor. Forbids cost-plus-a-percentage-of-cost fee system, but directs maintenance of cost-plus-a-fixed-fee system, and if there is no limitation of profits in law, directs profits of no contract shall exceed 7%. All contracts are subject to Walsh-Healey Act, Davis-Bacon Act, and Eight Hour Law.

#### 200,000 Privately Built Houses Have Priority

In the defense areas during 1942 it is the program that 150,000 dwelling units shall be built by the Government with public funds, and 400,000 units built privately with private funds. OPM has set aside high priority ratings in the A series for 200,000 units to be built by private means. Materials will be available for the additional 200,000 when they are necessary. It apparently is anticipated the greatest part of this financing will be provided with the aid of the Federal Housing Administration. Since the emergency began until the end of 1941 the FHA insured loans for private financing of more than 300,000 dwelling units, of which 80% are located in defense areas. Over 203,000 of these homes were started during the first 11 months of the year.

Private homes built with FHA underwriting were the usual four to six room houses costing from \$2,800 to \$5,500, depending upon size, location, and regional construction requirements. In the New England area, typical houses varied from \$4,000 to \$4,700; in the industrial area of the middle East they ranged from \$3,790 to \$5,000; in the South from \$2,800 to \$4,850; in the Great Lakes region from \$4,000 to \$5,500; and in Los Angeles prices ranged from \$3,600 to \$3,950. The largest number were launched the last months of the year in the Los Angeles area, 14,000 units. The Great Lakes area came second with more than 11,000.

Title VI is the new FHA provision which enables contractors to secure FHA insurance for loans used to build houses in defense areas to be sold or to be rented. Congress provided \$300,000,000 for this purpose. Over \$175,000,000 worth of Title VI loans were insured before the end of 1941. In addition, all dwellings for which foundations were in place on October 9th, 1941, no matter where they are located, non-defense or defense areas, have been made eligible for high A rating priorities to secure materials to complete the structures.

#### Special Help for Non-Defense Houses

Order P-71 authorizes priorities for non-defense homes and apartment houses. Applications for Priority Ratings may be obtained through the FHA field offices. It is estimated over 70,000 dwelling structures will be completed under this Order. Another Order, P-55, provides special Priority help for owners of privately-financed defense housing designed to be sold or rented in the defense areas. Special provisions are made for private builders who have a schedule for the construction of a number of new houses to be started each month. Application forms PD-105 Revised may be obtained from the local FHA offices and from building and loan associations.

A group in Government is trying to work up a plan by which taxpayers may be forced to invest some part

(Continued on page 204)

# 7th International Heating and Ventilating Exposition Postponed

THE following statement was released to AMERICAN ARTISAN by the International Exposition Co.: "The serious emergency created by the recent sudden turn of events in the world has made it advisable to postpone the 7th International Heating and Ventilating Exposition which was scheduled to open at Philadelphia on January 26 of this year.

"Conditions facing the heating, ventilating and air conditioning industry, the limitations necessarily placed on production for civil use, and the all-out effort to war-condition the Nation have caused manufacturers to feel that exhibiting at this time would

detract from the war effort. A poll of all exhibitors indicated that the majority favored discontinuance of the Exposition.

"In view of this situation, the Advisory Committee has approved the postponement of the Exposition. This action is endorsed by the Management of the Exposition and will permit all exhibitors to devote every energy to the work of preparing for Victory at the earliest moment possible."—(Signed) 7th International Heating and Ventilating Exposition, International Exposition Co.

## Warm Air Meeting Still Scheduled

THE following telegram was received from George Boeddener, managing director of the National Warm Air Heating and Air Conditioning Association, immediately after receipt of the above announcement: "You no doubt have or will learn that the heating and ventilating exposition which was planned for Philadelphia has been called off. This does not in the slightest degree affect the holding of the twenty-eighth annual convention of the National Association. In fact, it is more than ever necessary for all manufac-

turers and those jobbers and dealers who can to attend. The warmth-producing products of the warm air industry are prerequisites to a successful war effort. Gentle and balanced shooting of warm air is just as necessary as quick shots from a Garand and the killing blows of a Captain Kelly. Let us all meet in Philadelphia on January 27th and 28th. Have the industry bring their problems with them. We'll try to find the answers."—(Signed) George Boeddener, Managing Director.

## PROGRAM

### 28th Annual Convention, National Warm Air Heating and Air Conditioning Association

Benjamin Franklin Hotel, Philadelphia, Pa., January 26, 27, 28

#### Monday, January 26—Board of Directors and Committee Meetings

9:30 a. m. —Board of Directors  
Research Advisory Committee.  
Installation Codes Committee.  
Michigan State College Short Course Committee.

#### Tuesday, January 27—Crystal Ball Room

9:30 a. m. E. S. T., President C. A. Olsen, Chairman.  
President's Message, C. A. Olsen.  
Our Country, Representative of the National Manufacturers' Association.  
Building Construction Industry in 1942, Thomas S. Holden, President, F. W. Dodge Corp.  
Our Industry's Objectives and Responsibilities in the War Effort, W. L. McGrath, Member Plumbing and Heating Industry Defense Advisory Committee.  
2:00 p. m. E. S. T., H. S. Sharp, Chairman.  
Objectives and Functions of Emergency Committee, I. L. Jones, Chairman, Emergency Committee of the Warm Air Furnace Manufacturing Industry.  
Simplification and Elimination of Waste, P. S. Miller, Chairman, Elimination of Waste Committee.  
Defense Housing Priorities, OPM Representative.  
Product Requirements Plan, OPM Representative.  
Contract Distribution, OPM Representative.  
9:30 p. m.—ASHVE "Evening of Magic." Two-Hour Show by Paul Fleming and Co. Ball Room, Bellevue-Stratford Hotel.

#### Wednesday, January 28—Garden Terrace.

9:30 a. m., E. S. T., F. G. Sedgwick, Chairman.  
Our Research Activities and Cooperative Effort with Our Government, F. G. Sedgwick, Chairman Research Advisory Committee.  
Our Codes—Today and Tomorrow, W. D. Redrup, Chairman, Installation Codes Committee.  
Oil Test Code, Professor A. P. Kratz, University of Illinois.  
Standard Code Application Manual, Professor S. Konzo.  
Short Course, Professor Lorin G. Miller, Michigan State College.  
Election of Officers.  
2:00 p. m. E. S. T., Joint Session with American Society of Heating and Ventilating Engineers, Rose Room, Bellevue-Stratford.  
Presiding, C. A. Olsen, President, National Warm Air Heating and Air Conditioning Association. W. L. Fleisher, President, American Society of Heating and Ventilating Engineers.  
Pressure Loss Caused by Elbows in 8-in. Round Ventilating Duct, M. C. Stuart, C. F. Warner and W. C. Roberts.  
Observed Performance of Some Experimental Chimneys, Richard S. Dill, Paul R. Achenbach and Jesse T. Duck.  
Heat Loss Through Basement Walls and Floors, F. C. Houghten, S. I. Taimuty, Carl Gutberlet and C. J. Brown.  
Adjournment.



AMERICAN ARTISAN

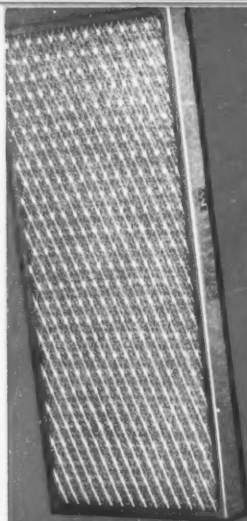
# RESIDENTIAL AIR CONDITIONING

S E C T I O N

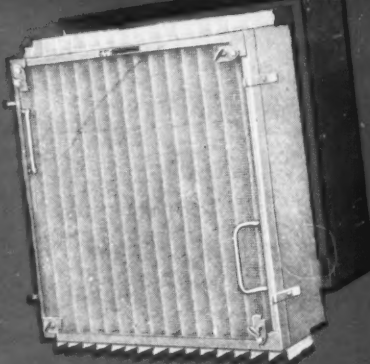


DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING

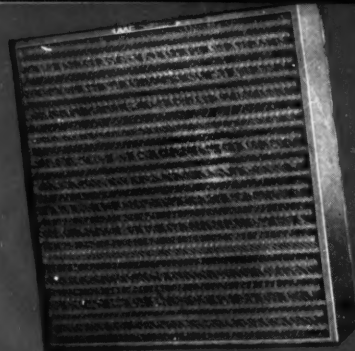




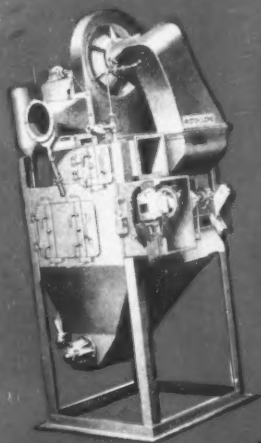
Airplane Engine Intake Filter developed in cooperation with army and aircraft engineers.  
Bulletin No. 306.



AAF Airmat Dry-Filter extensively used in Ordnance and Powder Plants—approved by National Board of Fire Underwriters.  
Bulletin No. 230B.



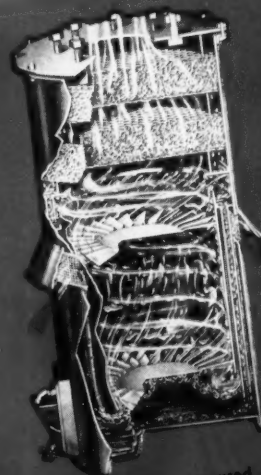
AAF permanent washable viscous unit filters for cargo ships and industrial plants. Ideal for heavy duty service.  
Bulletin No. 201D.



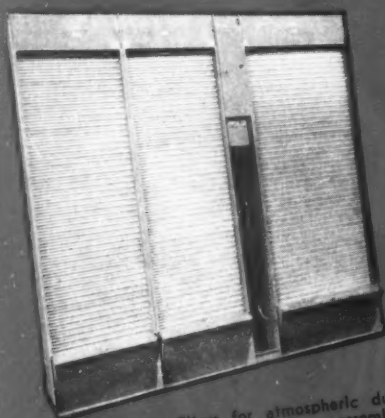
AAF Kato-Clone Type W (wet), Type D, (dry)—used to collect foundry dusts—and in the machine tool and chemical industries.  
Bulletin No. 274A.



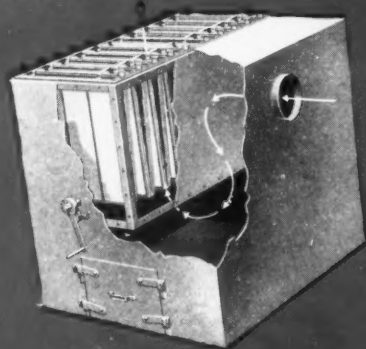
AAF Electro-Matic self-cleaning filter is widely used in aircraft motor manufacturing plants.  
Bulletin No. 250C.



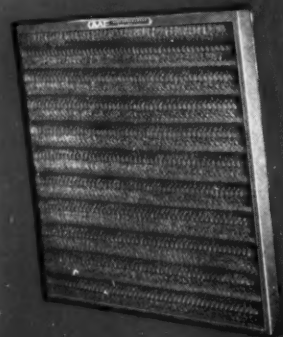
AAF Cyclo air cleaners are used on gasoline and diesel engines and on compressors.  
Bulletin No. 130C.



AAF Automatic filters for atmospheric dust control. Widely used in airplane assembly plants.  
Bulletin No. 241.



AAF Airmat Dust arrester collects dust from buffing and polishing operations. Used by aircraft engine parts and supercharger manufacturers.  
Bulletin No. 280.



AAF permanent unit filter for cleaning air supplied to barracks and theaters, in army camps and cantonments.  
Bulletin No. 201D.

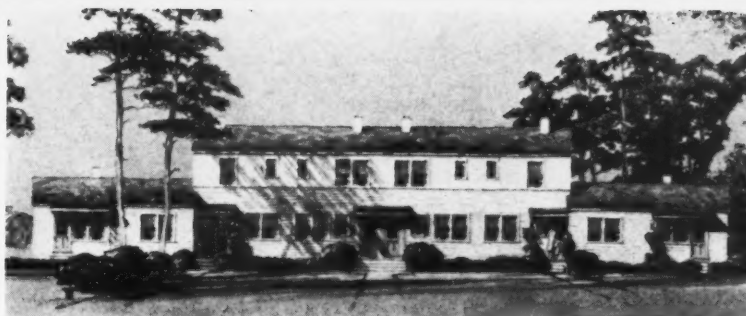
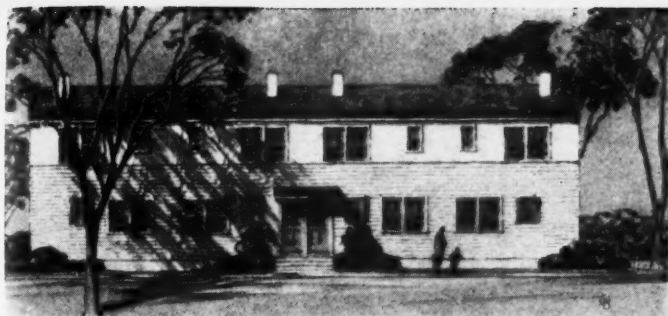
# necessity put CLEAN AIR on the Priority List

Wherever the countless Defense materiel are being made, to supply armies now at war, clean air is playing a vital role in keeping production lines moving at unprecedented speed. Men and women who operate machines must breathe freely of clean wholesome air and those machines must be protected from the ravages of abrasive dust. American Air is proud of the important part it is

playing in the war production program. AAF filtration and dust control equipment delivered to manufacturing plants directly engaged in making war materials comprises approximately 92% of our output. Pictured above are but a few American Air Filter products. Write for descriptive bulletins and engineering data.

353 CENTRAL AVE., LOUISVILLE, KY.





Above—Four family (left) and six family (right) FWA publicly financed housing structures. Materials differ, but the general design and the floor plans (below) have been standardized. Photographs of exteriors in the four actual projects surveyed show this standardization.



As of December 24, FWA had placed under contract some 87,000 housing units built with public funds. Planned for enlisted personnel, defense industry workers and civilian army and navy personnel, low rent and low cost is essential. This survey tells how warm air heating systems were installed in four typical projects.

## Furnace Installation Procedure In Four Public Housing Projects

TOWARD the end of World War I, it was feared that if hostilities continued beyond 1918 such a serious shortage of housing would develop that production would break down in many areas.

That experience was heeded last year when the Congress passed Public Act 671 and Public Act 849 (Lanham Act) making available funds for public financing of some 100,000 housing units in 254 "critical areas" where acute housing shortages already existed or would likely result.

It was established that in these "critical areas" private construction could not be expected to furnish housing for workers who could afford to pay less than twenty dollars per month for shelter. Also, that the war industries arising in many of these areas were true "war babies" which might completely close down after the war—the workers returning to former homes or drifting to other parts of the country. Government would, therefore, have to take the risk and supply the money for shelter required during the emergency.

Also facing the planners was the problem of providing housing for the families of the civilian employees of the army and navy; housing for the families of the enlisted personnel of the army and navy; both groups unable to pay rents profitable to private house financing.

First the Congress gave the President 100 million for housing army and navy enlisted personnel families. Next 150 millions (Lanham Act) to be

spent in housing "critical areas," cost per housing unit limited to \$3,950. With these funds it is hoped that 80,000 to 100,000 housing units—all for rent; some of them temporary; none in competition with private financing or building—will result. In addition, private money is expected to provide an additional 120,000 housing units to be rented or sold, to be built under Title VI—in the same areas.

These 80,000 or 100,000 publicly financed units scheduled for 1941 quite likely will be augmented in 1942 by a much wider and larger program as war industries are greatly expanded and the armed forces enlarged.

### Constructing Agencies

To correlate and supervise this program of government, the FWA (Federal Works Agency) was set up as the overall control. Under FWA are several agencies—PBA (Public Buildings Administration); revamped USHA (United States Housing Authority); OADH (Division of Defense Housing)—and lesser agencies engaged in special fields. How these agencies are set up and how they function has been reported in past issues. Also who buys materials and equipment; how the contracts are let; the part contractors play—are summarized in this month's Washington Letter.



### Construction Progress to Date

As of December 24, 1941, defense housing had been started, was under way, or had been completed in 40 states, in the District of Columbia, and in five territories—45,229 houses were occupied or ready to rent and 87,254 houses were under contract. In some areas where there is little defense manufacturing or small military activity, defense housing has been meager (Delaware, 20 housing units). But in other areas where defense industries are booming and the military is concentrated, defense housing has been tremendous (California, 11,000 housing units).

In order to speed up the program and conserve effort, a basic architectural design has been developed. This design includes a two-family, a four-family and a six-family building. Inside, the basic plan centers around a two-bedroom and a three-bedroom unit as shown on plans accompanying this report.

### Forced Warm Air and Floor Furnaces

Two types of heating have been decided upon—central warm air furnaces with ducts leading to each room and warm air floor furnaces singly or in pairs. Fuel depends on local costs, but coal and gas are preferred—see analysis in the October, 1941, issue, page 58. Since all these furnaces are

placed in utility rooms or furnace alcoves, forced warm air is largely specified.

Because space is at a premium and because unit heat loss is in the 60,000 Btu range—a new type of furnace has been required. Popularly known as the PBA-18 furnace, the distinguishing characteristics are a 26 by 26-inch base on the floor; an unhoused blower placed to the rear and housed by the heating installer; simple control systems, largely mechanical; upright casing and plenum.

### American Artisan Surveys 4 Projects

Because this public housing has become so important an activity, but more because it now seems likely that the over-all program will be greatly enlarged in 1942, American Artisan visited, photographed and studied typical projects. From the projects visited four were selected for report and survey.

These four projects are located in South Bend, Indiana; Rantoul, Illinois; Fort Wayne, Indiana; and Burlington, Iowa. These projects will house industrial workers and families of enlisted personnel.

The purpose of this survey is to give readers some insight into the type of building, type of heating equipment, size of the project and contract and how the contractor organized and carried out his contract.

## *Burlington, Iowa*

Two, four and six family units for defense industry workers. Heated by PBA-18 coal-fired, forced warm air furnaces (Ingersoll Steel and Disc Co.). Duct work fabricated in a job shop.

**O**UTSIDE Burlington, Iowa, the Iowa Ordnance Plant, one of the largest shell loading plants in the world will, in full operation, need 7,000 employees. To house these industrial workers FWA built 575 housing units of the two, four and six-family type.

The contract for installing furnaces and duct work was let to Northwest Roofing and Cornice Co., of St. Paul, Minnesota. Since the project

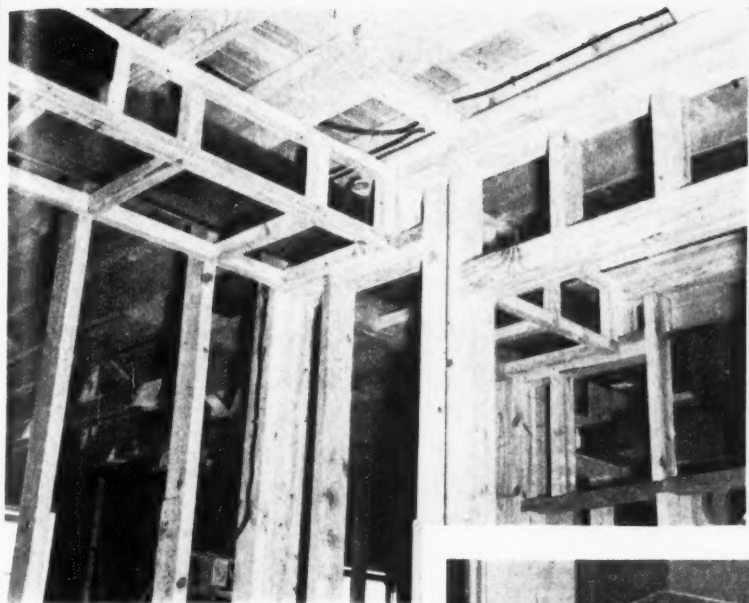
was far from home A. L. Gaughan of the Northwest Co. elected to do all work on the site and equipped a complete sheet metal shop there. Furnaces and blowers were supplied by the government; Northwest furnished the material and accessories.

Many things seemed to work against rapid completion of the contract—furnaces were slow in

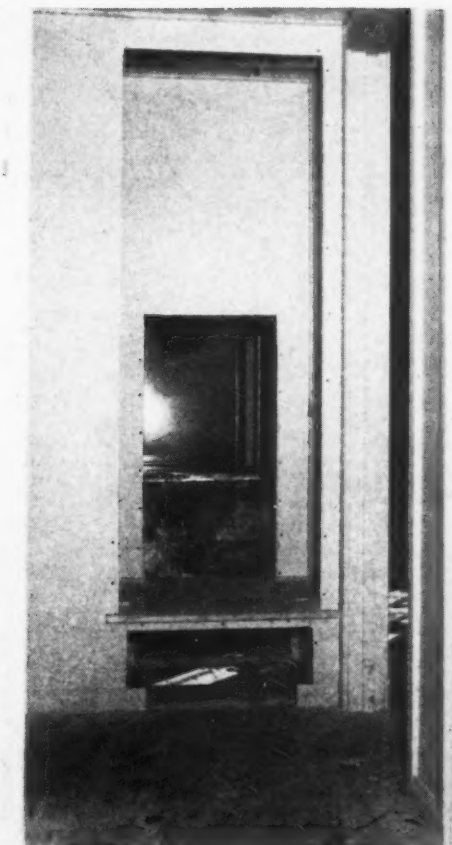
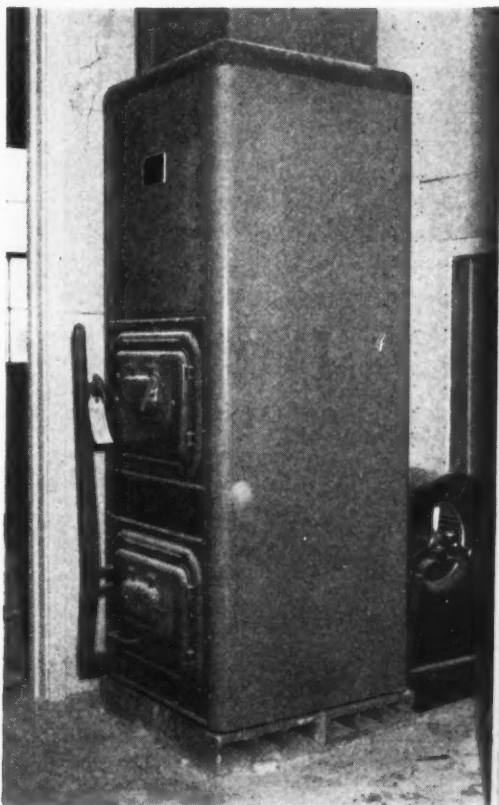


In foreground—two family building; center, two single-family units; background, a six-family unit—all in Burlington, Iowa. "Dog houses" are outside coal bins.

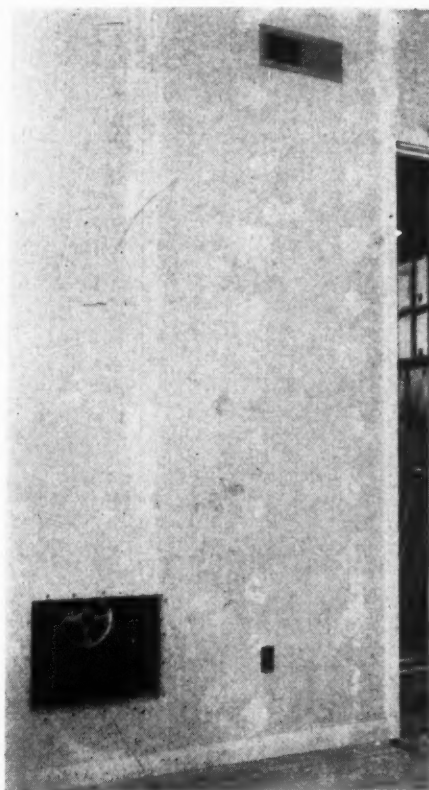




Above—Stack and duct work in a six-family unit. 26 and 30 gauge black iron, unpainted, used. Duct sections erected piece by piece. Below—High side wall, two-way deflecting register and return air opening in living rooms. Blower can be seen through return opening.



Above—Looking at the back of a furnace. Opening at floor is return from bed room; closet floor has been raised to take a short duct. Blower housing is a wrap-around built by contractor (see text). Left Hand-fired, coal furnace on tile foundation; unhoused blower in rear.



arriving; sheets were received and then taken away; most serious of all the weather elected to rain constantly until the whole project was a sea of Iowa mud. Despite these handicaps and despite a scarcity of mechanics, Northwest made fair progress—due primarily to good planning.

Furnaces were delivered by rail at a siding, then trucked to the job and unloaded at the house assigned. Northwest had to uncrate the furnace and move it into place. These furnaces are Ingersoll Steel & Disc Steel, coal fired, PBA-18 units with unhoused blower.

#### Shop Fabrication

Flat sheets were received at the shop and stored as well as possible under tarpaulins. A schedule was prepared listing all the straight sections, fittings, connections, etc., for the three types of systems. The layout is identical with the plans shown for the South Bend house. Some idea of the complexity of this schedule is indicated by a shop list which itemized 156 fittings for six-family, 127 fittings for the four-family, 24 fittings for the two-family, 10 fittings for the one-family housing unit furnace system.

With the schedule, field drawings and patterns



Views of project shop with lock forming machine in center and assembly benches around walls. Some 100 odd patterns were required for the 300 and more fittings needed. Approximately 85,000 pounds of sheets were cut, formed and fabricated in this shop.

prepared showing each piece and the framing schedule in hand, Northwest proceeded to fabricate and deliver to each house the necessary pipe work. Fabrication was planned around a lock forming machine—duct and fittings for mains and branches was built up as one top, one bottom and two side pieces with the top and bottom flanged and the Pittsburgh run along each edge of the side pieces. Drive cleats were also made in the machine and then cut to exact length and stored for delivery to each house.

#### Ducts Erected Piece by Piece

As each house was framed and partitions set, a full set of duct work was trucked from the shop to the house. Northwest found erection could not be handled by assembling sections on the floor and putting up the whole system at once; neither was it possible to make up sub-assemblies, so each section was erected individually and cleated.

A wrap-around housing was made for the blower consisting of the back, cut out for cold air duct, the two sides and the cut out top. This wrapper was assembled on angle iron framing and connected to the cold air duct and the furnace casing. The separate inspection door was made up from a flanged and hemmed sheet.

#### Crew Procedure

The shop crew varied according to labor supply and general construction progress. Sometimes practically the whole crew worked in the shop; sometimes most of the men worked at erection with only a skeleton crew in the shop. The problem was to maintain a balance.

One man and a helper usually constituted the crew to erect the ducts in the six and four-family units. One man usually could and did hang the ducts in the small houses. One man and a helper set the furnaces and connected the plenum to the mains; connected the cold air and housed the blower in the four and six-family units, but one man could do this same job in the small houses except to set the furnace on the tile foundation (see photograph).

#### 26 and 30 Ga. Black Iron Ducts

Perhaps the most unusual feature of this contract was the use of 26 and 30-gauge black iron for the ducts. This was erected without paint of any kind. The original plan was to use 26 and 24-gauge galvanized, but government recalled early deliveries and substituted 26 and 30-gauge. This light gauge material did not help speed the job because such light material does not work well through the lock former—it wrinkles, runs off the edge, is tight and loose by inches and, finally, when assembled, the fitting is so flimsy that care in handling must be taken to keep the section square and true until finally hung in place. That Northwest was able to keep any kind of schedule was remarkable with such material and under the adverse conditions of job progress and weather.

Two large furnaces were included—one each for the administration and the maintenance building. A photograph shows one of these being assembled on the concrete floor of the utility room.

For the 575 furnace systems in housing proper approximately 100,000 pounds of sheet metal were required. Also, 575 Minneapolis-Honeywell regulators were used.



Art Gaughan, left, and D. L. Shaw, right, who organized, managed and supervised the 575 furnace project, are shown assembling the casing for the administration building furnace.





All units in Miami Village are one-story, two, three or four-family buildings built on a concrete slab, with coal-fired, forced air furnaces.

## Fort Wayne, Indiana

Two, three and four-family units, for non-com officers' families. All one story, on a concrete slab foundation, heated by PBA-18 coal-fired, forced warm air furnaces (Lennox Furnace Co.) with duct work fabricated in local contractor's shop and delivered ready to hang.

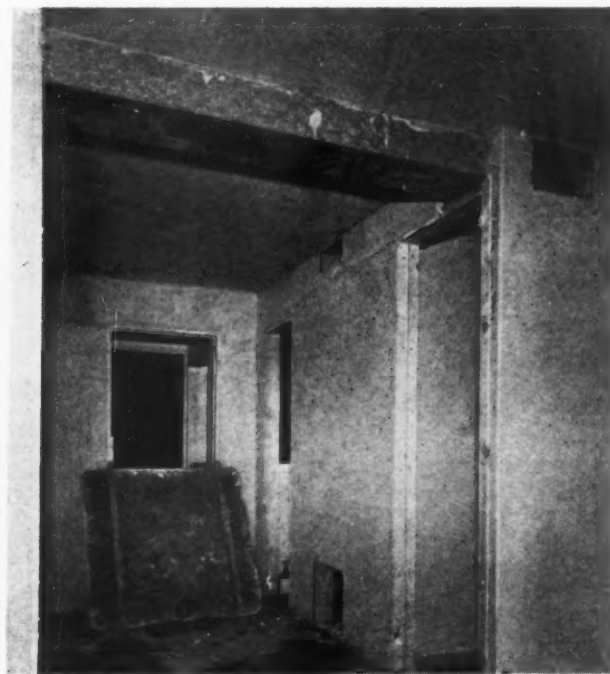
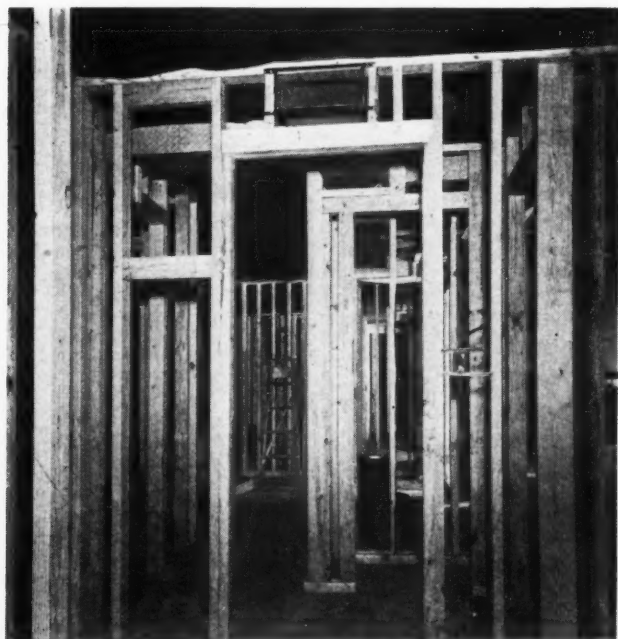
THE 75-family Miami Village development in Fort Wayne, Indiana, comprises only one story, two-, three-, four-family units, designed by A. M. Strauss, Fort Wayne architect of wide small housing experience. There is no basement—instead a full concrete slab is laid on the ground and the framing erected thereon. Occupants will be families of non-commissioned officers from a near-by air field. They will rent.

Fort Wayne Air Conditioning Company installed Lennox coal-fired, forced warm air furnaces in all 75 of the units. The layout is simple—two units end to end so that in each building heater alcoves adjoin and pipe work runs out from the furnaces toward the end of the building. The plan for the three bedroom unit shows this arrangement clearly.

Originally contracted in September, 1941, construction was delayed for nearly a month, but with a signed contract, Fort Wayne Air Conditioning Co., elected to proceed with fabrication and, as a result, had almost one half of all the duct work fabricated and stored before the first house was ready for the duct work.

Since the project is only a few miles from the contractor's shop, everything was fabricated in sections (sections indicated on plans) and either stored in the basement or delivered to a field stock pile.

Because all piping plans for buildings of the same type are identical, it was possible to make up 45 sets of piping for the two-bedroom units; 20-sets for the three bedroom units and 10 sets for the one bedroom units. Divisions in the pip-

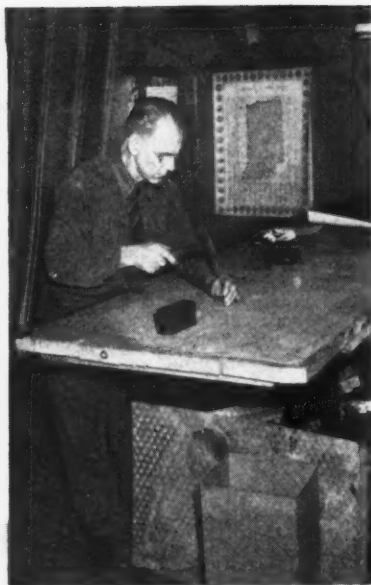


Left—Duct work looking toward the furnace (two furnaces stand back to back in adjoining utility rooms); Right—Duct work above door to furnace room. Three warm air openings and the return to blower are shown. Framing has been covered with wall board.





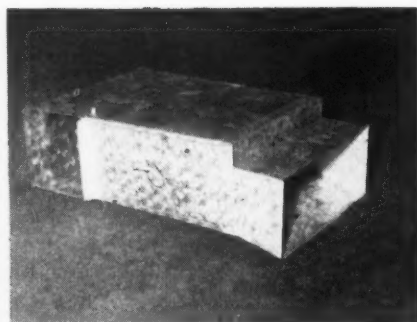
Above—Putting a Number 2 fitting together (see duct layout)—Pittsburghs on sides; top and bottom flanged. Finished pieces in background.



Above—Metal templates were made for each piece and sheared sheets were pricked for forming in quantity.



Above—Mechanic is holding the damper ready to place it in an assembled Number 2 fitting (see duct layout); register box has been cleated to Number 2 fitting



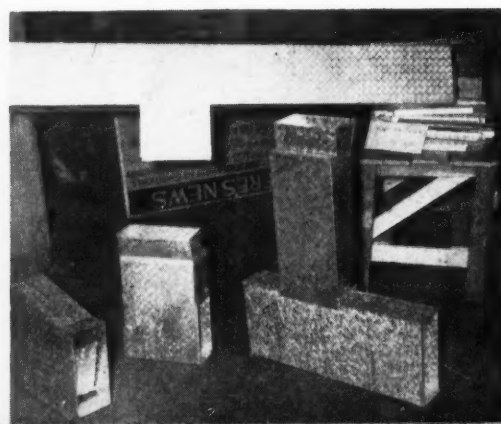
BX11 and BX12 sections assembled made a two-branch section of the main with register box.



Above—Lock forming side rail for offset fitting, typical of all short section construction. Below—Four typical fittings (see duct layout for location in assembly).

Above—Putting last bend in section XV4, Pittsburgh already formed on edge. Below—Assembling Number 1 plenum section (plenum top and duct take-off). This fitting identical for 65 houses.

Below—About 5,000 cleats of various sizes were formed and cut in the shop and delivered to the job.



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ing were made as shown on the plans, one of the principal factors being to make pieces which could be put together into sub-assemblies for erection. Thus the plenum constituted one sub-assembly for erection; the take-off and first elbow a second sub-assembly; the long straight section and first branch a third sub-assembly; the last straight piece and last branch or branches another sub-assembly.

On this project Fort Wayne Air Conditioning Co., furnished the furnaces. For the pipe work approximately 20,000 pounds of galvanized iron were required.

Figure 10 is a detailed schematic of a mechanical layout, likely for a building's ventilation system. It shows a network of ducts, plenums, and diffusers, with various dimensions and flow rates specified.

**Key Components and Dimensions:**

- Plenums:**
  - Top left:  $20 \times 20$  inch plenum.
  - Bottom left:  $20 \times 20$  inch plenum.
  - Top center:  $20 \times 20$  inch plenum.
  - Top right:  $12 \times 6$  inch plenum.
  - Bottom right:  $12 \times 7$  inch plenum.
- Ducts and Diffusers:**
  - Top center:  $14 \times 5$  inch diffuser,  $145 \text{ cfm}$ .
  - Top right:  $12 \times 6$  inch diffuser,  $75 \text{ cfm}$ .
  - Bottom center:  $14 \times 7$  inch duct,  $225 \text{ cfm}$ .
  - Bottom right:  $14 \times 6$  inch diffuser,  $150 \text{ cfm}$ .
  - Bottom right:  $14 \times 5$  inch diffuser,  $130 \text{ cfm}$ .
  - Bottom right:  $14 \times 6$  inch diffuser,  $160 \text{ cfm}$ .
- Velocity Diagram (Bottom Left):**
  - Shows air flow rates in  $\text{cfm}$  and areas in  $\text{sq. in.}$  for different duct sizes.
  - Flow rates:  $740$ ,  $515$ ,  $440$ ,  $310$ ,  $160$   $\text{Vol. cfm}$ .
  - Areas:  $140$ ,  $98$ ,  $84$ ,  $84$ ,  $42$   $\text{Area sq. in.}$ .
  - Velocities:  $760$ ,  $755$ ,  $754$ ,  $552$ ,  $550$   $\text{Velocity}$ .
- Room Layout:**
  - Top left: Bathroom.
  - Top center: Kitchen area.
  - Bottom center: Corridor.
  - Bottom right: Room with a door.

Typical floor plan of two-family building—the two apartments end to end with furnace rooms side by side on each side of the dividing wall. Duct systems are identical except one is left and the other right hand. Sections into which the ducts were divided for fabrication and erection by sub-assemblies are indicated by cross lines and numerical designation of each section. Various photographs show fabrication of several of these sections. Duct work is suspended from the lower chord of the roof trusses, but is plastered in as shown in photographs.



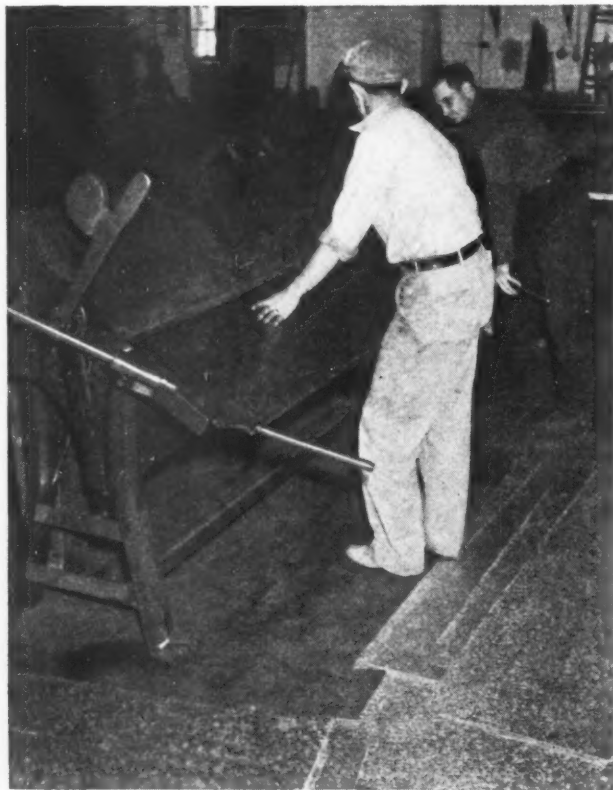
Four-family buildings in Rantoul—one of FWA's first projects.

## *Rantoul, Illinois*

Two, four and six-family units for enlisted personnel of the air corps. Heated by coal-fired, forced warm air furnaces (18-inch standard, cast iron, round cased Sunbeam). Duct work fabricated complete, ready for erection, in contractor's shop about 15 miles away.

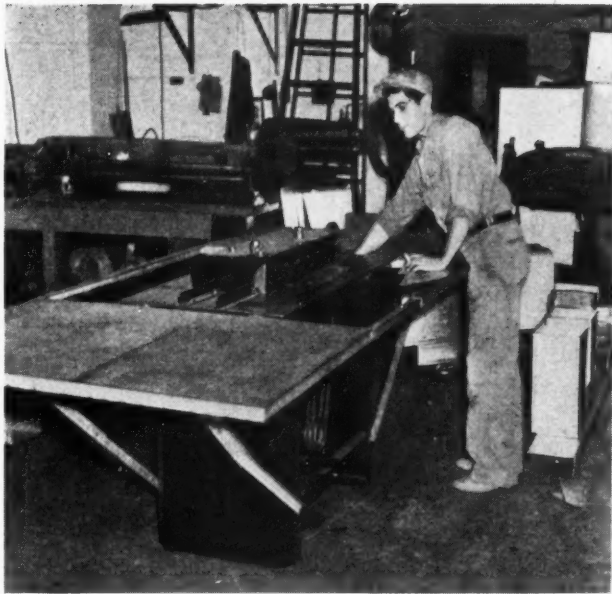
ONE of the first projects let to contract was the 72-unit development in Rantoul, Illinois. Houses are rented by non-commissioned air corps personnel. Mid-States Engineering Co. of Champaign, Ill., took the contract and installed Sun-

beam cast iron, round cased furnaces with separate blower. This project, in a measure, was experimental; one of the important decisions reached by FWA was that standard furnaces such as these took up too much space. From this and



Mid States Engineering Co. fabricated and assembled all duct work in its Champaign shop and delivered complete sections to Rantoul. Braking straight sections, left, and rolling curved side pieces, right.





Above—Duct construction was planned around Pittsburgh seams on all side pieces with top and bottom flanged, or wrap around and Pittsburgh'd on small ducts. Right—Typical duct sections in foreground and the small shear used to cut sheets for forming.



other early projects came the decision to specify a smaller furnace. This led to the development of the type of furnace now known as the PBA-18 whose chief characteristics are not over 26 by 26 inches on the floor, a Btu output of 60,000, 600 cfm unhooded blower.

The units in this development followed standard floor plans and comprise two, four and six-family buildings with concrete block first stories and frame second stories. The layout of the rooms and the required heating layout is practically the same as the plans shown in the first pages of this report.

#### Duct Design and Fabrication

Mid-States Engineering Co., elected to fabricate all duct work in Champaign and truck sections to Rantoul. Fabrication is shown in several shop photographs. Duct sections were divided into straight sections and fittings and identified for erection.

Construction for the larger sections consisted of an edged top and bottom with a Pittsburgh on two edges of each side sheet. Hand shears, hand brake, hand edgers were used with the Pittsburgh machine. Since the largest section is not very large, all sections were assembled in Champaign and delivered ready to hang. Sections of duct work were connected with flat drive cleats, but

the plenum was connected with standing seam drive cleats to obtain additional stiffening.

Mechanics in the shop were not divided into crews—instead the usual brake, shear, bench men were used as requirements dictated.

#### Field Crew Assignments

In the field, however, crews were assembled in order that each job might progress to completion. Two men constituted a furnace crew. This crew uncased the furnace, assembled the casing and plenum, set the furnace and connected the plenum to the duct work. Two or three men comprised a duct crew and these men worked from high horse scaffolds to place the duct sections, the stacks and connect the sections piece by piece.

The furnace crew also assembled the blower housing which Mid-States furnished as a wrap around—two sides, back and top. The cover in the top for inspection and oiling was made up in Champaign. Either the furnace crew or the duct crew put on the registers and grilles. For this project 473 registers and grilles were needed. All registers are in the high side wall. Returns are stamped, plain grilles without louvers.

Mid-States fabricated some 16,000 pounds of galvanized iron, mostly in 26 gauge in the contract.

This project was one of the first built and duct work varies somewhat from layouts shown for other projects, but essentially, duct layout is like others.

## South Bend, Indiana



Two, four and six-family units for defense industry workers. Heated by PBA-18 coal-fired, forced warm air furnaces (Ingersoll Steel & Disc Co.). Duct work fabricated in local contractor's shop and delivered as complete sections ready to hang.

◆



Above—Two family, end to end, unit with six-family unit in background. Center—Warm air register on stairway of six-family unit and cold air grille. A short duct runs under stair to furnace behind register. Below—Base and plenum of hand-fired, steel furnace (PBA-18) on standard tile base.

FOR industrial workers in South Bend factories, PBA has built two projects, the largest consisting of 500 housing units in two, four and six-family buildings as pictured in photographs. The installing heating contractor was Joseph C. Lauber of South Bend.

In this project FWA furnished the furnaces (Ingersoll Steel & Disc), the unhooded blowers, the registers and grilles and the controls. The Lauber contract included purchase of sheet metal, the fabrication and erection of the duct work, installation of sleeves for roof vents, attic ventilating louvers, chimney flashings, door flashings, gutters, Transite gas flue.

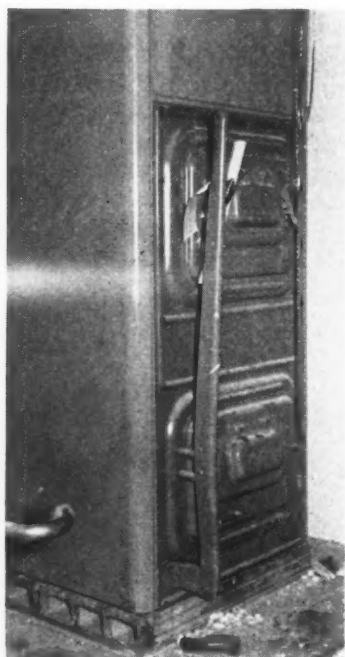
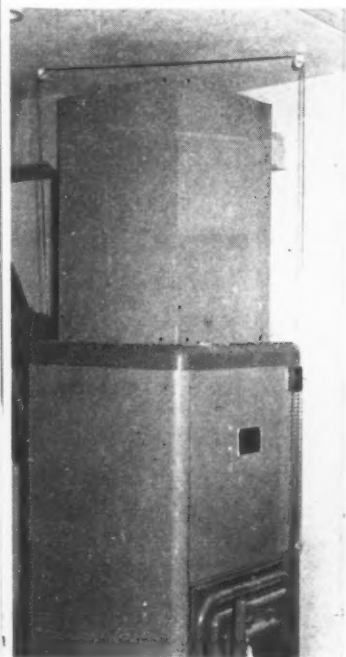
### Preliminary Planning

Joseph W. Lauber, son of founder Joseph C. Lauber describes the handling of the contract, as follows—

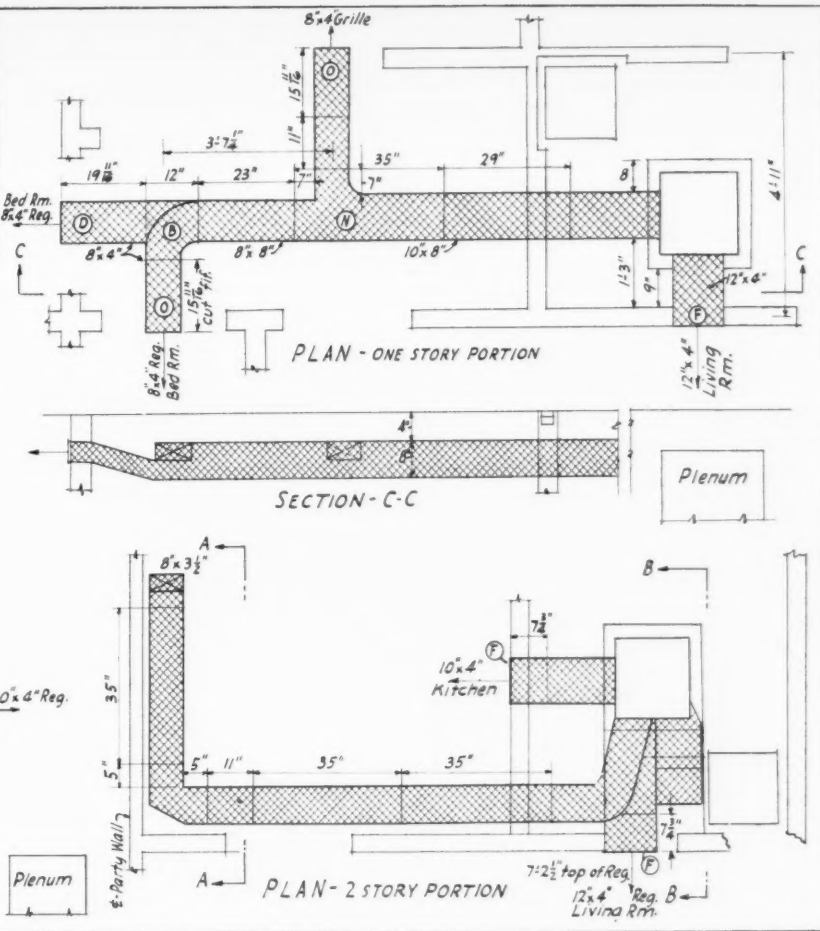
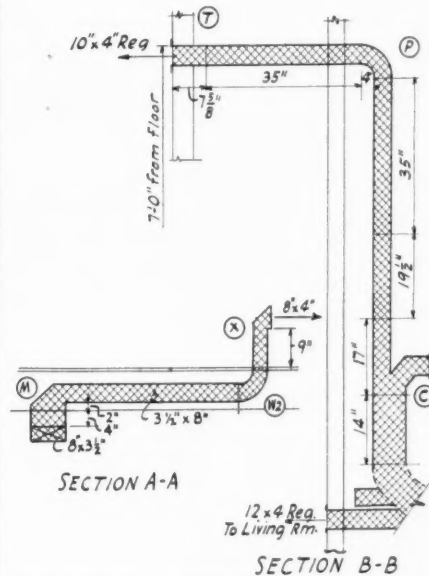
"Upon receipt of the contract we prepared large scale drawings for each of the three house units. Each fitting was designated with a symbol and each fitting or section was made to exact length except one fitting in each run which was made a trifle longer than necessary and was cut on the job to allow for inequalities in construction. This plan proved highly successful.

"Next door to our shop was an old store room which we took over and equipped with benches, folders, lockforming machine, edgers and flangers so arranged that semi-production line flow of material could be sustained.

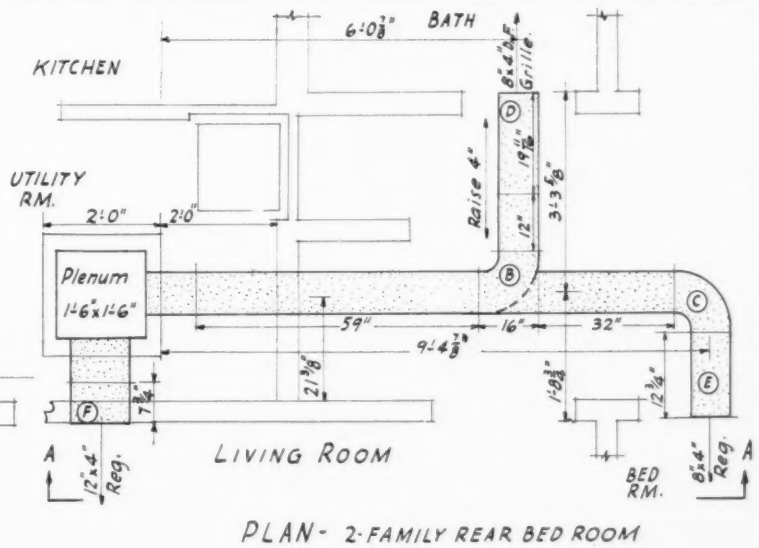
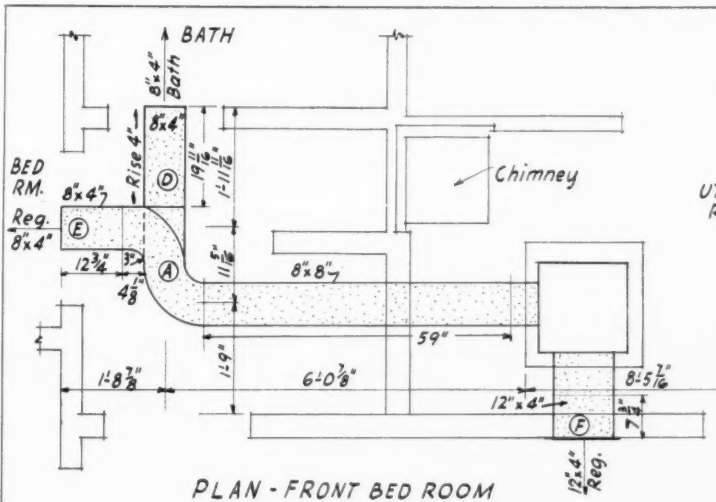
"We appointed a shop foreman and picked a special crew whose duty it became to produce, on schedule, the straight sections and all fittings in pace with erecting progress. The 500 units in the contract were split between two sites and we appointed a field foreman to keep the furnaces and duct work going in as framing progressed. We experienced no conflict between the two organiza-



SCHEDULE			SCHEDULE		
Mark	No. Site 2	No. Site 1	Mark	No. Site 2	No. Site 1
X-Stackhead 8x4	60	140	D-Stackhead 8x4	30	70
W-2 Fitting	60	140	O " 8x4	60	140
V-Stackhead 4x10	60	140	F " 12x4	30	70
D-Fitting	60	140	B-Fitting right	15	35
T-Stackhead 4x10	120	280	B " left	15	35
F " 4x12	60	140	N " right	15	35
4x10 Pipe 35'L	120	280	N " left	15	35
4x10 " 19 1/2'L	60	140	8x8 Duct 23'L	30	70
3 1/2x8 " 35'L	180	420	8x10 " 29'L	30	70
3 1/2x8 " 11'L	60	140	4x8 " 11'L	30	70
8x10 " 14'L	60	140			
M-Fitting	60	140			



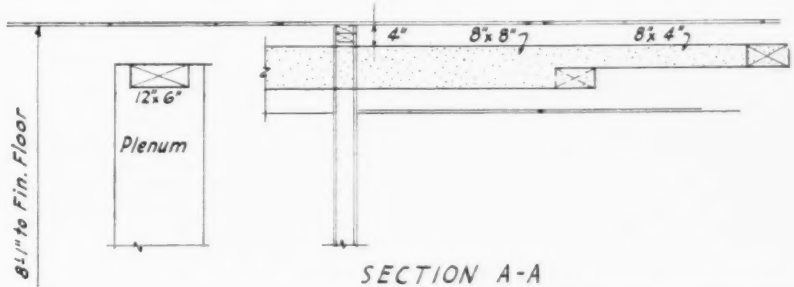
Above is the plan, elevation, details and duct section schedule for a system installed in a six-family housing unit (four apartments of two-story and two apartments of one story) by the J. C. Lauber Co. Below is the plan and section schedule for a two-family, one story unit. The number of pieces of each type required for the duct system is shown on the schedule and identified by letter on the drawings. These numbers also indicate pieces for fabrication.



SCHEDULE		
Mark	No. Site 2	No. Site 1
A-Fitting 2pcs.	12	26
B-Fitting 2pcs.	12	26
C-Fitting 1pc.	12	26
8x8 Duct 59" Long	24	52
4x8 " 32" "	12	26
4x8 " 12" "	12	26
D-Fitting Stackhead	24	52
E " " "	24	52
F " " "	24	52
18-8" Slips	} per bldg.	
14-4"x2-8" Drives		

N.B. 1-C Fitting 4x8 Duct 12" Long.

} With Dampers.





tions.

"The fabricated duct sections were trucked from the shop to the job where we placed identical pieces together in a stock pile. Then, later, this stock pile was distributed through the houses, while the shop kept the stock pile stocked. Exterior flashing and chimney flashing was placed as the building went up.

"First floor duct work was erected as soon as the frame was up. Second floor duct work was installed as soon as partitions were erected. In these buildings the utility room is plastered so we could not set the furnace and connect to the duct work until after the plaster was on and finished with two coats of paint.

#### Duct Erecting Procedure

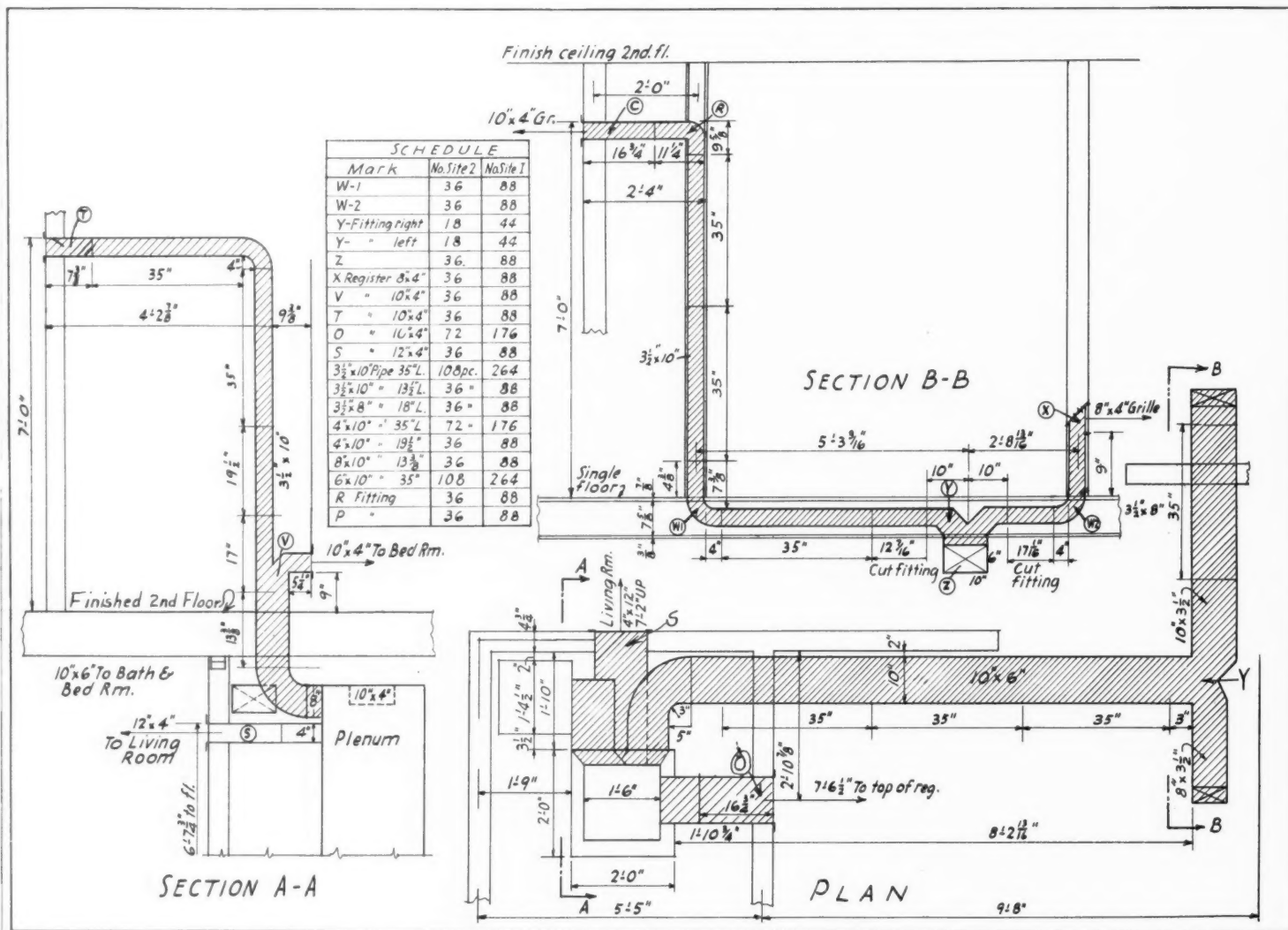
"We did not find it expeditious to assemble or sub-assemble sections for erection, instead each piece was erected separately. This was not so difficult a task because these furnaces are small and

comparatively light in weight. Also, we brought our ducts through the wall so one section between duct work in place and the plenum completed the work. The furnace, the plenum, the smoke pipe, the water heater vent, the duct connection were installed at one time by a crew of two journeymen. In the houses the furnaces set back to back so this two-man crew worked two furnaces simultaneously, joining forces when this was most expeditious.

"Duct seams are conventional slip and drive cleats. Elbows, fittings and straight sections used the Pittsburgh lock for the corner seams.

"The warm air and return faces were put in place after the pressed board walls were painted. The pictures and plans show the short and straight return pipes and the high side wall registers. The last thing we did was to cover the small roof above the entrance doors with tin while the porch was on the ground after which the roof was erected by the carpenters."

A total of 127,000 pounds of sheets were used.



Plan, elevation, details and piece schedule for a four-family, two story housing unit. Ductwork fabricated and installed by the J. C. Lauber Co. On the two sites a total of 62 right hand and 62 left hand systems like this were required. The schedule also indicates that careful planning made it possible to fabricate some pieces for use in more than one location. The text explains how the material was fabricated and how erected and the organization required.

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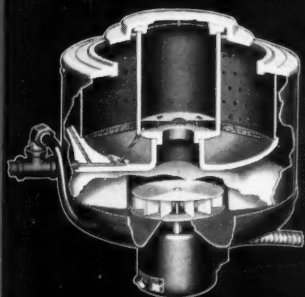
GILCO "C" SERIES WITH  
VAPORIZING POWER BURNER



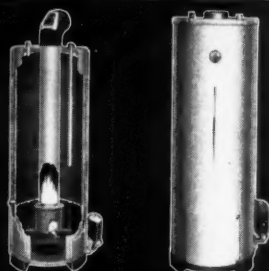
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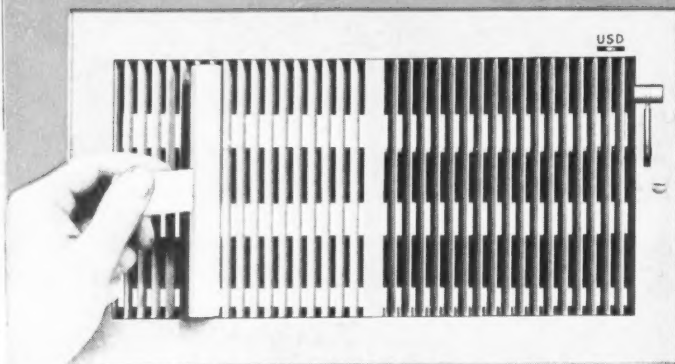
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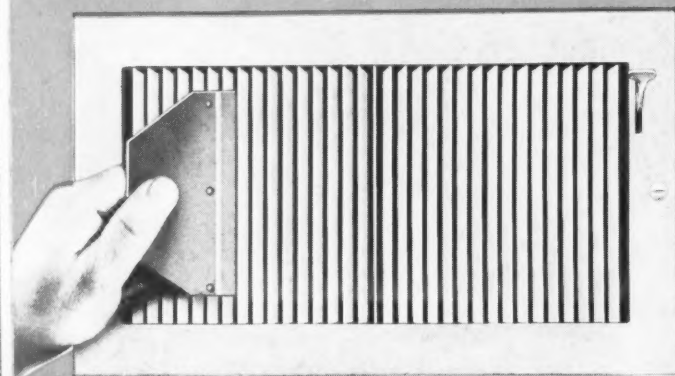
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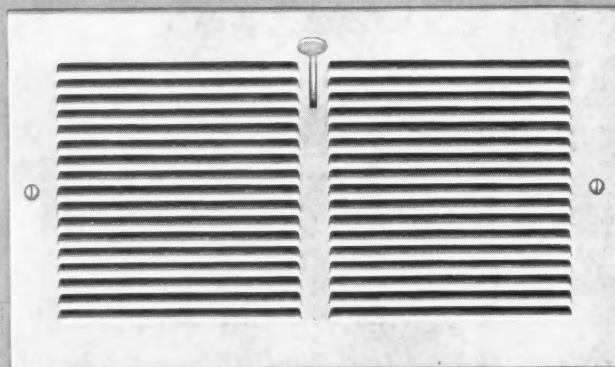
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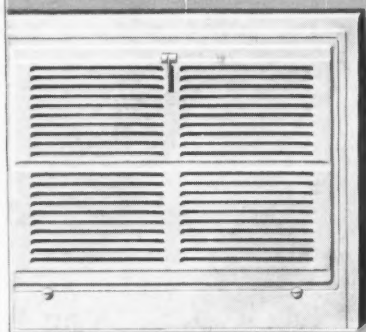
No. 4432 Airo-Flex Multi-Louvre Adjustable Face Register



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No. 800 Heat-Rite 2-Piece Gravity Baseboard Register

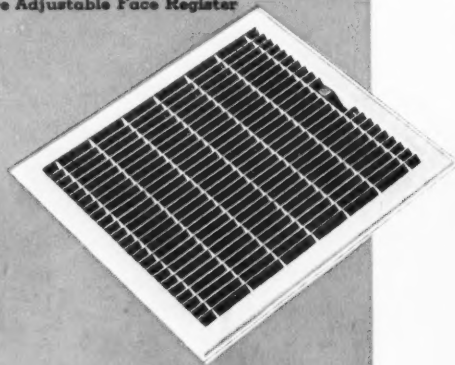


Fig. DR DuraBilt Narrow Mesh Floor Register



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# Warm Air Panel Heating

## In U. S. Residences

In the editors' opinion, the most interesting development of 1941 is the attention beginning to be paid to warm air panel heating. Only a beginning has been made, but time may show this is a truly portentous development for our industry.

**I**N the judgment of many engineers and scientists the most interesting and perhaps the most portentous development in American heating practice is the introduction to resident requirements of radiant panel heating.

As practiced today in America and also in Europe where radiant panel heating has had wide acceptance in industrial, commercial and public buildings, the usual heating element has been hot water, steam, or electric panels.

Only very recently has warm air had any consideration, yet the interesting fact is that warm air panel heating is probably the world's oldest central system with the "hypocaust" (Webster—"A series of small masonry chambers and flues through which heat of a fire was distributed to rooms"), of the Romans, producing practically the identical effect sought by today's radiant panel heating advocates.

Also significant, it is believed, is the fact that in America a very large percentage of the one hundred odd panel heating installations is in residences (Europe has few residential panel heating jobs) and quite a percentage of the residential installations use warm air as the working substance.

Considerable publicity has been given radiant panel heating using steam, water, electricity—both in the business papers, in the semi-scientific journals and even in the popular magazines. Al-

most nothing has been published on radiant panel heating using warm air—yet warm air panel heating for residences has been in daily use under owner occupancy in several sections of the country.

### Three Types of Panels

Three groups of warm air panel system have been selected for study here. These three groups of systems have been selected because they represent three types of American practice. These three groups and types have been engineered and installed by C. A. Robinson, 13175 Ilene Ave., Detroit; Everett S. Buck of Fort Wayne Air Conditioning Co., 223 East Main Street, Fort Wayne, Ind.; International Heater Company, Utica, N. Y.

The Robinson systems roughly use equally ceilings, outside walls and floors as radiating panels. The Buck systems use the floor as the chief source of radiant effect. The International Heater Co. systems use principally ceilings as radiating panels.

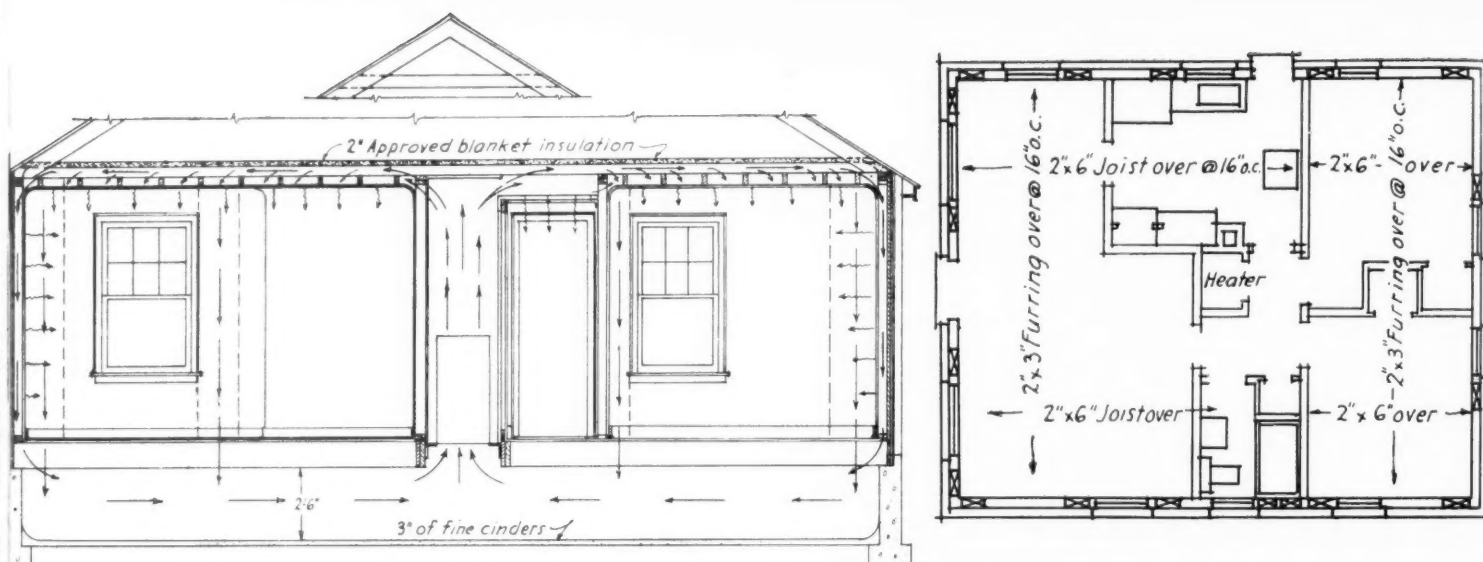
In point of age the first Robinson installation was made in 1934—in all, fourteen installations have been made and are in everyday use. The first International installation was made in 1939—to date three houses are radiant heated in Utica. The first Buck installation was made in 1929—thirteen houses are now heated by "warm floors."



C. A. Robinson's ninth installation, a two-story house with both floors heated by panels. Built in 1940.



Third Robinson installation, a one story panel. House built in 1936. Plans following show details of both these houses.



Elevation and plan of third Robinson installation showing centrally located gravity warm air furnace, gas-fired—no basement. Note air flow across ceiling with passages made by laying 2 by 3's across joists. Also construction at top and bottom of outside wall to let air flow down. All outside wall stud spaces except over windows used to return air.

## Robinson Systems (*Ceiling, Wall, Floor Radiating Panels*)

C. A. ROBINSON has supplied a wealth of data on his various houses. From the fourteen installations, two have been selected for explanation. The first house to be reported was the third installation made and is selected because the house has no basement; all rooms heated are on the first floor, and the house has been continuously occupied since 1936. The second house is selected because it is a two-story structure; was the ninth installation, made in 1940; both floors are heated; and complete temperature data are available.

The house at 9531 Carlin Ave., Detroit, was built in the fall of 1936. The house has a living room, dining alcove, kitchen, bath and two bed rooms on the first floor—there is no basement.

A floor plan shows room arrangement. An elevation shows the space between earth and floor, position of the heater, travel of air to warm room surfaces. This same elevation shows building construction required to use air flow through walls and ceiling. A photograph shows the exterior.

Since this installation was made, the house has been continuously occupied and temperature tests have been taken from time to time. There has never been more than three degrees of temperature difference throughout the rooms at any test period. Further, the heating expense has averaged \$38.00 a year.

This brief description will focus attention on the features required in small, basementless houses of this general type. Arrangement is such that the furnace can be located at the center point of the house. In this house the heater is an oil-fired, gravity, warm air furnace, placed above the

opening into the earth-floor space as shown in the elevation.

There is no bonnet or plenum as such—instead the furnace is built into the alcove so that the insulated walls of the alcove constitute a plenum. To get the warm air across the ceilings of all rooms the ceiling joists were run as shown on the plan. Then across the joists 2 by 3-inch furring strips were nailed on 16-inch centers so that there is a 3-inch space between ceiling and bottom of the joists.

The warm air, rising from the heater spreads between joists, passes from joist space to joist space through the 3-inch spaces made by the furring until the whole ceiling becomes a blanket of warm air and a radiating panel. In this house the inside partitions do not carry heat.

### Nature Provides Air "Flow"

The crux of the method is to "pull" the air out toward the outside walls where the air can drop through all stud spaces into the return space under the floor.

Nature does this without any help other than structural framing which provides parallel passages to the outside walls. Mr. Robinson explains this—"The greatest ally we have in warm air heating is gravity. Why must we depend on gadgets to overcome gravity when we can put it to work for us? By introducing air through an inside stack where there is almost no friction and allowing the air to return down outside walls where nature gives the air a "push" is making the grav-

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ticular house all available warm spaces were used to carry air down, excepting stud spaces above and below windows.

#### How Many Return Stud Spaces?

In the fifth house erected—a two-story structure heated with a hot water boiler and copper coils in the warm air riser to heat the air—all outside wall stud spaces were used at first to return air. Stud spaces were gradually closed off until the minimum number of spaces conducive to good circulation were determined. Roughly the minimum area required was approximately equal to the area of the warm air riser, but with this plan, there was found to be some difficulty in keeping rooms facing cold winds warm when the stud space area for that room was less than the area of the warm air riser. The conclusion, generally, is that use of all stud spaces permits the system to balance itself against exposure more readily than when only a few stud spaces are used around the four walls.

#### Test Shows Temperatures

Coming back to the two-story, ninth installation, Mr. Robinson relates an interesting experiment. He reports—"This house was used to take temperature readings to submit to FHA to procure acceptance of this method of heating. Six heating engineers conducted a test as follows: On the day of test the thermostat was set back to a point where the furnace was closed down. Windows were opened to let the house cool off. Then, at eight o'clock, the windows were closed and the thermostat set at 80 degrees. Quickly the furnace was burning at full gas valve opening. Then room temperature readings were taken at half hour intervals as shown in the Record of Test in the adjoining column.—(Temperature readings taken 30 inches above the floor in most exposed corner).

#### Temperatures Too Low for Danger

Continues Mr. Robinson—"The inside temperature was 68 deg. when the thermostat was set back and the outdoor temperature was 27 deg. Three hours later (windows still open) the room temperature had dropped only two degrees while the outside temperature had dropped 5 degrees. This ability to retain heat and change temperature slowly is typical of these radiant heated systems.

"Note in the test sheet that the temperature at the stack reached equilibrium and stayed there. This, in my opinion, indicates that in a properly circulating system there is no fire hazard. By ten o'clock all six engineers complained of being too warm and by eleven were really uncomfortable. This could not be because room air temperatures were excessive. The test shows conservative temperatures, but the floor, walls, ceiling were all increasing in temperature and radiating heat to the occupants.

## RECORD OF TEST IN TWO STORY HOUSE

Location of Reading	Time of Reading—P. M.					
	8:00	9:00	9:30	10:00	10:30	11:00
	—Temperature Reading—Deg.—					
Bonnet of furnace...	89	206	232	234	236	237
Cold Air 1st. Fl. Base.	62	76	82	86	88	90
Top of Stack.....	78	125	140	140	140	142
1st Fl. Ceil. Plaster.	66	76	84	90	92	96
2nd Fl. Oak Flooring.	62	62	63	67	69	71
Living Room Air....	66	66	67	70	72	73
Library Air .....	66	66	67	69	71	72
Dining Room Air....	66	66	67	69	70	73
Kitchen Air .....	66	66	67	68	70	71
Lower Hall Air.....	66	66	67	68	69	70
Upper Hall Air.....	64	64	65	67	70	71
Bed Rm. No. 1 Air...	61	62	63	66	68	69
Bed Rm. No. 2 Air...	62	62	63	67	67	69
Bed Rm. No. 3 Air...	62	62	63	67	67	69
Bath No. 1 Air.....	63	64	65	68	70	72
Bath No. 2 Air.....	63	64	65	68	70	72
Bath No. 3 Air.....	62	62	64	67	69	71
Outdoor Temp. ....	22	—	—	—	—	18

"My feeling is that for the past fifteen years all our publicized improvements in warm air heating have been based upon the addition of more and more gadgets. The one feature these radiant panel systems have above all else is simplicity of equipment and operation.

#### Effect of Cold Walls

"We know that even at rest the body throws off about 400 Btu per hour and that while we say we are heating the air to warm the body we are really heating the air to reduce the amount of heat the body gives off. Since about 80 per cent of body heat dissipation is by radiation, we feel uncomfortable when we stand near cold walls, or cold glass areas, even cold floors. When walls, floors, ceilings are all warm there are no cold surfaces to radiate to, so we feel comfortable or warm. Furthermore we do not need large volumes of air to maintain healthful conditions.

#### Cost

"As to extra cost—proper construction to utilize radiant panel heating to the fullest advantage does require some changes in construction as shown in the cross sections, but these additions are neither costly nor difficult. In my installations, the reduced cost of equipment required and the lower heating costs have more than offset the extra cost of house construction."



## Buck Systems (*Floor Radiating Panel*)

**T**HAT warm air panel heating is not a skyrocket development of the last two or three years is indicated by a brief survey of the warm floor panel systems developed by Everett S. Buck of Fort Wayne Air Conditioning Co., Fort Wayne, Indiana, who in 1929-1930 installed a warm floor system in his own home in Cincinnati and lived with it for two years.

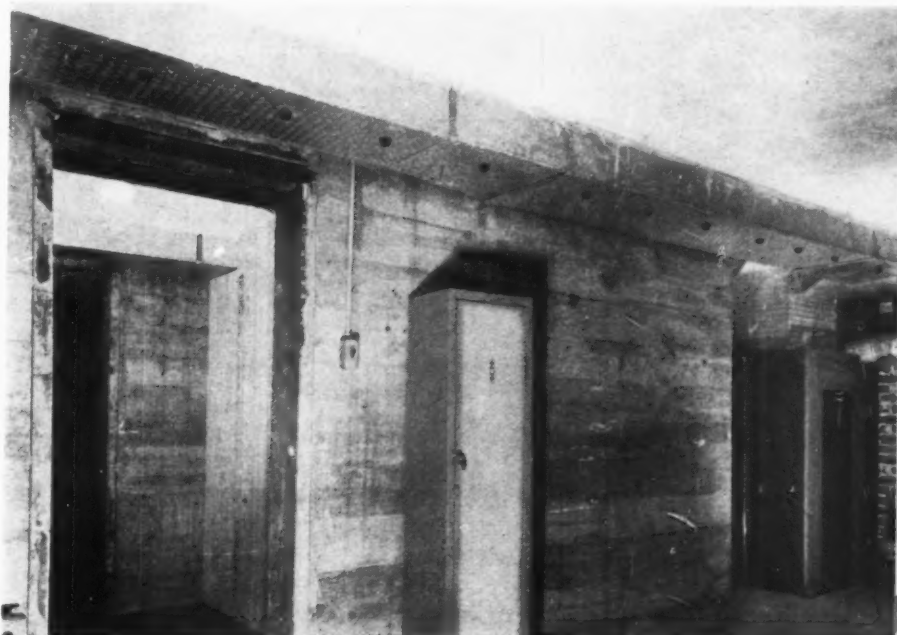
Subsequently, for friends and interested customers, installations employing warm floor radiant panels were designed and placed in operation. From these installations several conclusions have been drawn by Mr. Buck, as follows; 1: Widespread adoption of the warm floor panel method of heating must await changes in house construction; 2: A floor panel heating system, usually, will not be as cheap to install as the conventional forced warm air systems; 3: Heating fuel costs are much lower than usual systems; 4: The unusual comfort experienced has been universally commented upon by owners and visitors to these

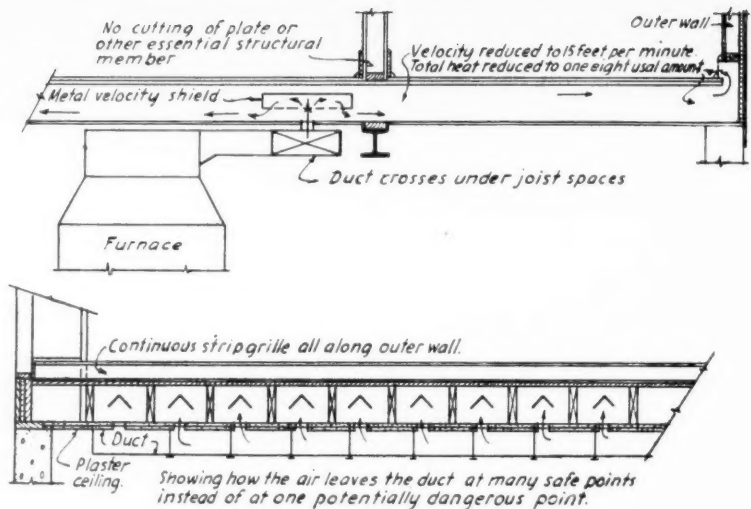
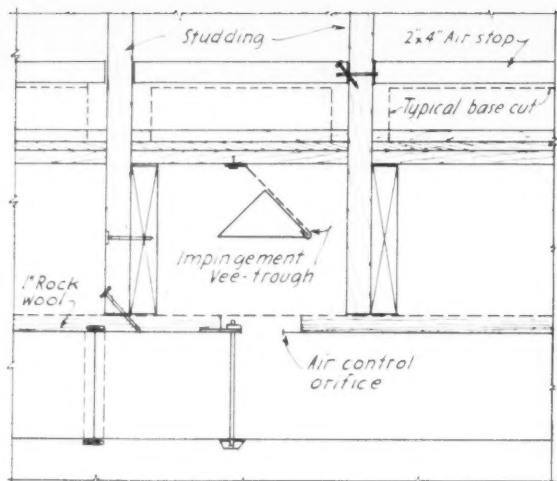
houses—unusual in that the lower the outdoor temperature, the lower the indoor temperature may be, because of the presence of the large, low-temperature radiating panel; 5: There is absolutely no perceptible air motion, yet it is obvious that the complete room area is blanketed by a constant flow of conditioned air.

From several installations furnished by Mr. Buck for study we have selected one (Alden D. Carvin residence) to show in plans and details; two others (Willard A. White and D. I. Weikel, Jr.) to show in photographs in order to explain the method.

In these Buck installations the floor is the principal radiating panel. And these Buck installations have another difference—the cleaned, moistened and tempered air after traveling from a central duct out through the floor joists to the outside wall is admitted into the room through grilles at the baseboard (see photographs and plans) and is then gathered into one return grille

Above—Continuous warm air register in baseboard, D. I. Weikel, Jr. residence. Registers are in outside walls only and open from every stud space. Right—View of two basement ducts in D. I. Weikel, Jr. residence. The knobs are adjustments for opening or closing air orifice from duct into joist space. See details following for more complete description. This is an Everett Buck warm floor panel installation.





centrally located and conveyed back to the furnace through a large, easily cleaned, all-metal return air duct. A blower is favored by Mr. Buck to maintain a constant "push" to move the air out from the furnace and into the room.

In these houses the furnace, having a blower, can be placed anywhere in the basement. A main supply is carried across joist spaces just below the joists. The detail sketch shows that the duct is separated from the joist space by the top of the duct and by plaster. Under each joist space a small hole, from  $2\frac{1}{2}$  to 4 inches approximately in diameter opens into the joist space. Above the hole an impingement plate a few inches long is placed to deflect the rising current downward and spread the stream into the space. (See detailed sketch.)

Ordinarily this main duct is run as nearly down the center line of the basement as possible in order to equalize the distance the air must travel from duct to outlet into the room and thus obtain a balanced flow.

The house shown in the plans was selected to show how a warm floor system is adapted to a two-story house. First floor distribution is designed as explained. To heat the second floor, the risers (one for each room) are carried up to the first floor ceiling and there become mains which carry across the joist spaces as shown on the sec-

ond floor plan. Admission of air from the duct into the joist spaces is similar to first floor practice. However, these second floor mains must be concealed by a furred down ceiling so the hall or rooms of secondary importance are ordinarily selected for the duct.

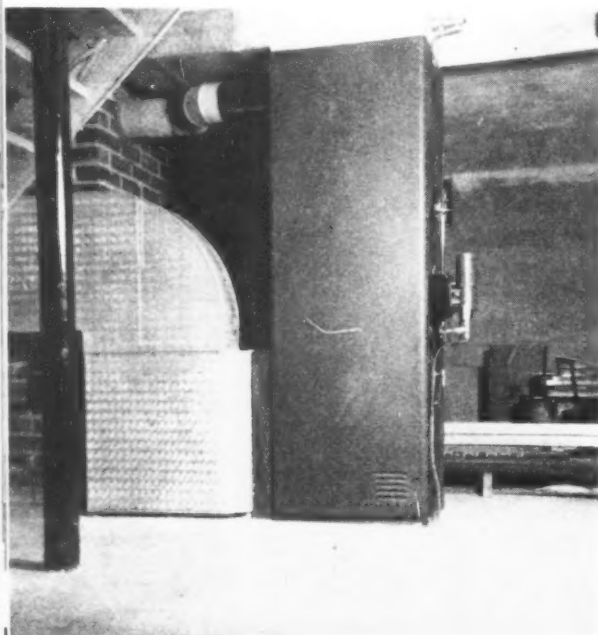
### Basic Design Principles

Briefly, here are the design principles of this system:

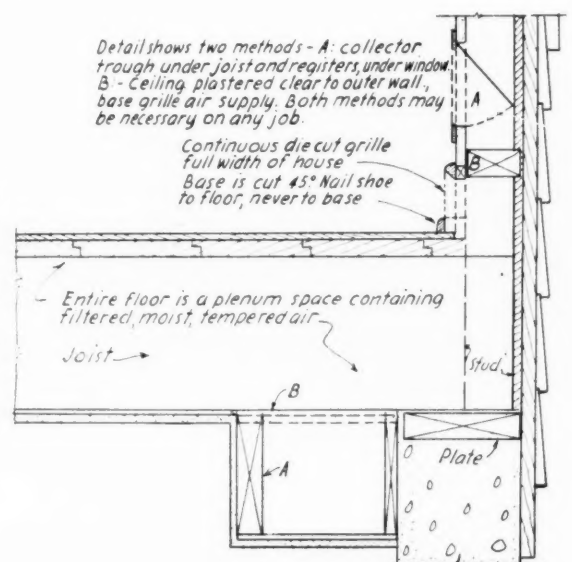
1) If possible every joist space is used to convey air from the main to the outside wall. Where a door prevents installation of the outside grille, the blocked spaces are fed and joist ends are drilled to let air flow out into open spaces.

2) The total heat required to offset heat loss is apportioned equally to the number of joist spaces under the room and the orifice hole and the end grille area and the setting of the damper are determined so that each space carries its share of the air from the main.

3) Plenum air temperature does not seem to be critical. Good results can be obtained with air at 400 degrees or with air at 175 degrees (plenum temperature). However, very successful installations seem to result when the plenum temperature is about 275 degrees at the maximum design outdoor condition with the furnace and fan operated constantly and provided with control stages so that this temperature fluctuates as little as possible.

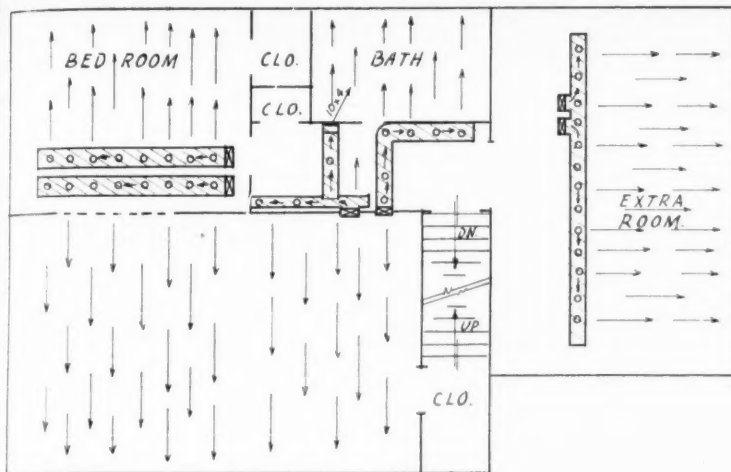


On this page are three details which show how the Buck duct is constructed; how air gets from duct into joist space; how air gets from joist space into room through baseboard register; design of orifice volume control and air spreader; and the oil-fired furnace in the residence of W. A. White. Note straight up plenum and main duct and the single return.





Ducts cross hatched in 1st. Floor ceiling Arrow show heat from same to 2nd fl.



4) If the room supply registers were dampered down nearly shut, air volume reduced and temperature raised, it would be possible to get a floor too warm. In the best installations, where plenum temperature is about 275 degrees, the floor temperature is about 95 degrees for a distance of about four feet out from the main, during maximum outdoor condition operating periods.

5) Characteristics of air circulation in the joist spaces seem to be the reason why plenum temperatures are not critical. With the outside end of the joist open there is almost no resistance to air flow, consequently the air flows out slowly and stratifies in the joist space. The layer against the floor gets cool and acts as an insulator for the layer in the middle. As a result, the air next to the floor does not stay as warm as the air a few inches below this layer and floor temperature seems to establish at a point well below the mean between the warm joist space air and the air in the room. This is better appreciated when it is realized that a room requiring 100 cfm may have 10 joist spaces under it—thus the air is moving

at but 10 feet per minute and air moving at 25 fpm (as it typically does above floors of conventionally heated rooms) is classed by the ASHVE as "still" air.

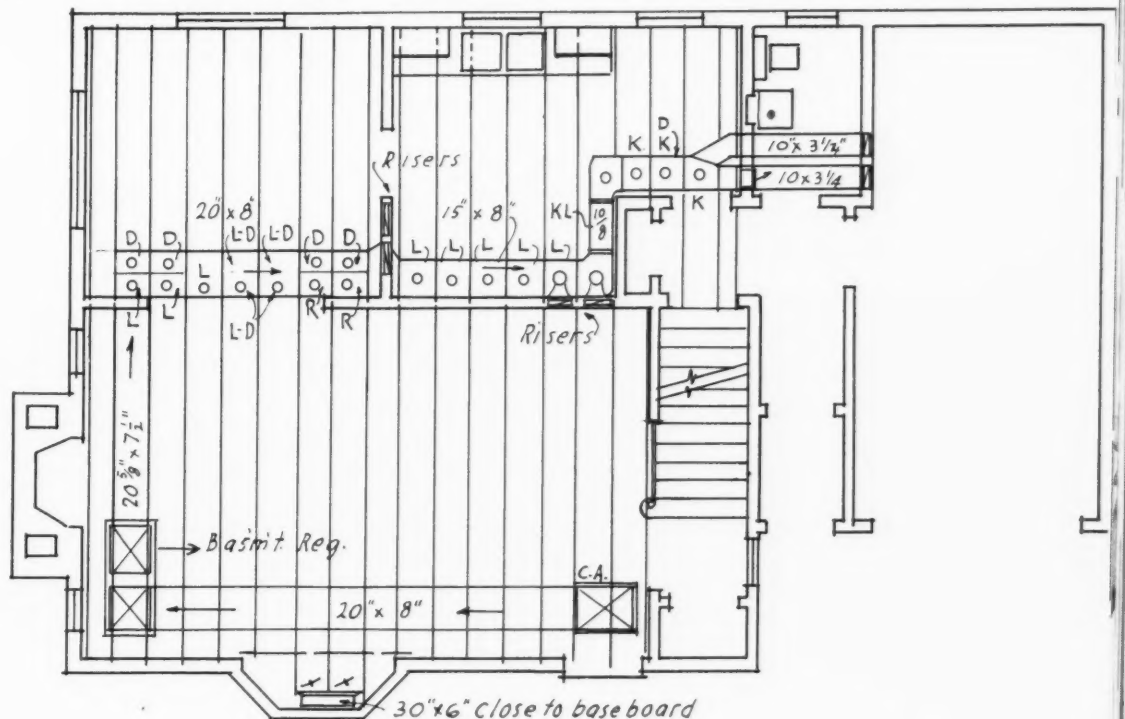
If the air in the joist space flowed uniformly and at high velocity through the space from orifice to grille, the floor would quickly approach duct air temperature and become too warm. The room, in turn, would quickly heat up and the thermostat shut down the furnace. Such intermittent cycling is not desired.

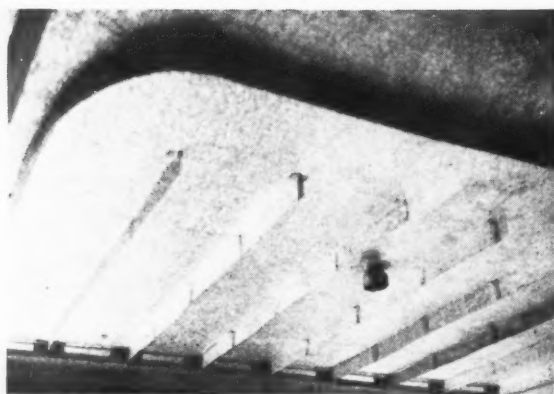
#### Constant Air Circulation Preferable

6) It is possible to set controls so that with a constant air flow the floor comes up to temperature, the thermostat is satisfied, the furnace shuts down, *but the fan continues*. As the air from the main cools down it then begins to take heat out of the floor materials; this raises the temperature of the air as it crosses the joist space, and this warm air comes into the room. Mr. Buck believes any furnace control method will work satisfactorily, but likes best the constant air flow system, with step control of volume synchronized with the fuel rates.

7) Mr. Buck points out that the fuel function of the heater must run about 20 times as long at 25 below zero as it does at 65 above. If the heat input is cycled you start at about 65 degrees which is return air temperature and progressively increase temperature until you reach the high limit control. The register air temperature never reaches a point of equilibrium UNTIL the furnace capacity, fan volume delivery, heat loss reach equilibrium and then, if the furnace is properly sized for this condition, heat input is constant, fan operation is constant and room temperature steady. The floor panel system tends to produce this same effect at all conditions.

Above—Second floor plan and, right—First floor plan of the A. D. Carvin residence. Note main for each floor, the orifice controls; air flow from mains to outside wall registers. Second floor ducts are concealed behind furring, or in halls. One return at the base of the stairs is used.





Four views of the ceiling plenum in the Barber residence. Note construction of pans with 2½-inch flanges and cleated sheet connections. The expanded metal lath for the ceiling is clipped to the flanges and plastered to form a 2½-inch deep plenum. At left is a warm air supply and a return air riser into a plenum. At right is the roof plenum for a second floor bedroom.



## International Heater Systems (*Ceiling Radiating Panel*)

IN Utica, New York, the International Heater Company, completed construction in March, 1941, of a test house in which a panel warming system was installed for study. The heating equipment consisted of a gas-fired boiler from which hot water was circulated through a heat exchanger over which air was forced by a blower. Leaving the blower, the air circulated through panels above the ceilings in each room. The gas boiler was used principally to secure uniform air temperature and heat delivery, and to check fuel consumption.

So successful was this test house that I. C. Barber, Assistant Sales Manager of the organization, determined to adopt warm panel heating in his new house, but in place of the gas boiler to use a direct-fired, oil-burning winter air conditioning furnace. This installation is shown in photographs and plans.

The International System of Panel Warming differs from the Robinson system of warm panels in ceiling, outside wall and floor, and from the Buck system of warm floors chiefly in that the ceiling only is used as the radiating panel.

The system is based on the principle of raising the temperature of the ceiling of each room in the coldest weather to approximately 98 degrees F., about equal to the temperature of the human body. From the warm ceiling a constant flow of

radiant heat waves pass through the air of the room without heating the air, to heat the walls, floor and furnishings. The rays of heat reflected to the walls and floors, plus re-radiation from these sources result in a constant cross-fire of heat rays through the room.

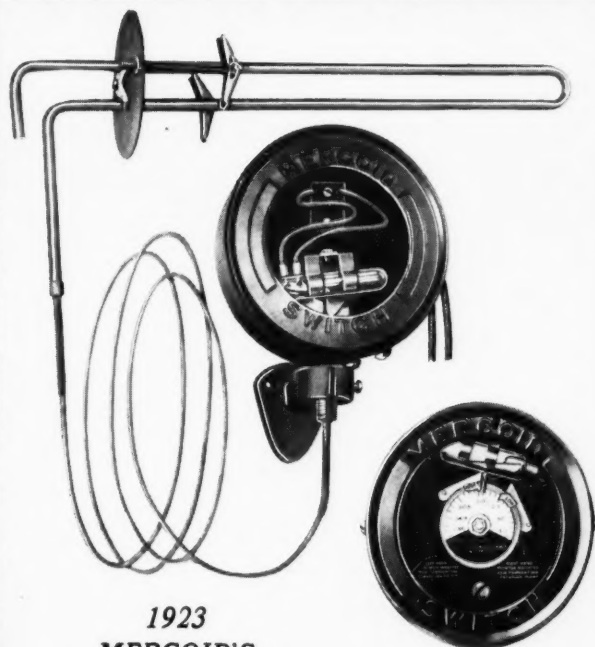
Because the source of heat is above the head, very little air circulation is established. If the heat source were low, so that the warm air can rise above the source, circulation is established—this is the theory of the system. In this system the room air is warmed by contact with warm walls and floor, but the air never attains the temperature of these radiating surfaces.

### Construction of Plenum

In this system the air warmed by the furnace is conveyed to a plenum or shallow chamber below the joists (see floor plans), the lower surface of which is the plastered ceiling. In the ceiling plenum the air is mechanically circulated from the entrance into each ceiling plenum throughout the ceiling and leaves the plenum at a point close to the entrance. This is shown clearly in the first and second floor plans.

This panel circulation might possibly be obtained in several ways, but in the Barber house, a full metal plenum is placed beneath the joists as shown in several photographs. This metal plenum

# THE EVOLUTION OF A WARM AIR FURNACE CONTROL



1923  
**MERCOID'S  
EARLIEST TYPE**  
*Illustration No. 1*



1941—**MERCOID'S LATEST TYPE**  
*Illustration No. 3*

The first Mercoid Furnace Controls were introduced in 1923. They utilized a remote stem charged with a liquid which when heated, produced pressure in a Bourdon tube type instrument to open or close the circuit (see illustration No. 1).

Many of these controls were sold and many are still in use where conditions prevail that do not subject the control to excessive temperatures.

In a great many early installations conditions were encountered where the temperature surrounding the bulb continued rising beyond the capacity of the instrument after the switch had opened. The number and character of these installations were such that in 1927 with the advent of bimetals suitable for use in high temperatures The Mercoid Corporation made available to the trade, the M-51 and M-53 (see illustration No. 2) bimetal actuated controls. These instruments were designed to withstand high temperature furnace conditions in the field. They also eliminated the mechanical injury such as often occurred to the stem or connecting tube of the remote stem instrument with its

resulting loss of liquid. Service on the M-51 and M-53 Controls has been remarkably low and the double adjustment features have been very popular. Hundreds of thousands of these instruments are in service.

Recently we have been aware of a demand for an external double adjustment needed in certain types of warm air heating equipment and we are now offering the Type M-41 and Type M-43 Controls (illustration No. 3) in a more compact and modern design including the proven principles and features established in the M-51 and M-53 with the addition of external double adjustment.

No calculations are necessary as the pointers on the dial indicate directly the high and low settings, and are visible through the cover. A summer switch is available on the Type M-43 Fan Control.

Like all Mercoid Controls, Type M-41 and M-43 include the well known Mercoid hermetically sealed mercury switch—a feature of unquestioned superiority in all around control performance—meaning years of trouble-free service.





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PAYNE is proud to share a part in the Preparedness Program. In twenty-nine army cantonments from coast to coast, PAYNE-

HEAT offers "Our Boys" healthful heat. In the emergency, the first duty of all of us is to our Nation. Hence PAYNE's "Priorities" policy is as follows: First, government requirements; second, established PAYNE Dealers; third, (if and when possible) new outlets. We deeply appreciate the courtesy which PAYNE Dealers and Gas Companies have displayed in cooperating with us where Defense orders have occasionally delayed our usual prompt shipment of heating equipment.

31

U. S. cantonments and bases for training armed forces of land, sea and air, equipped with PAYNE vented gas heat!

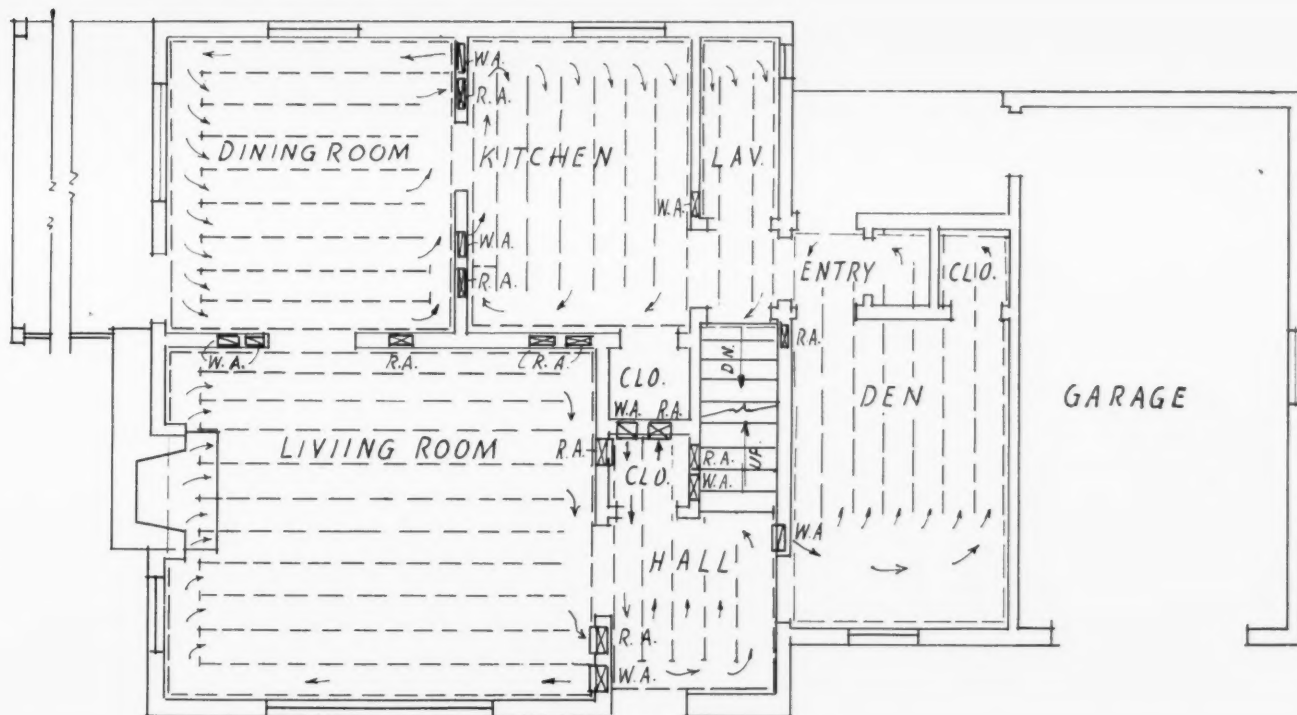
# PAYNEHEAT

MORE THAN A QUARTER-CENTURY OF



SPECIALIZATION

*Payne* Furnace & Supply Co., Inc., Beverly Hills, California



is constructed as parallel spaces with both ends opening into common supply and collecting headers.

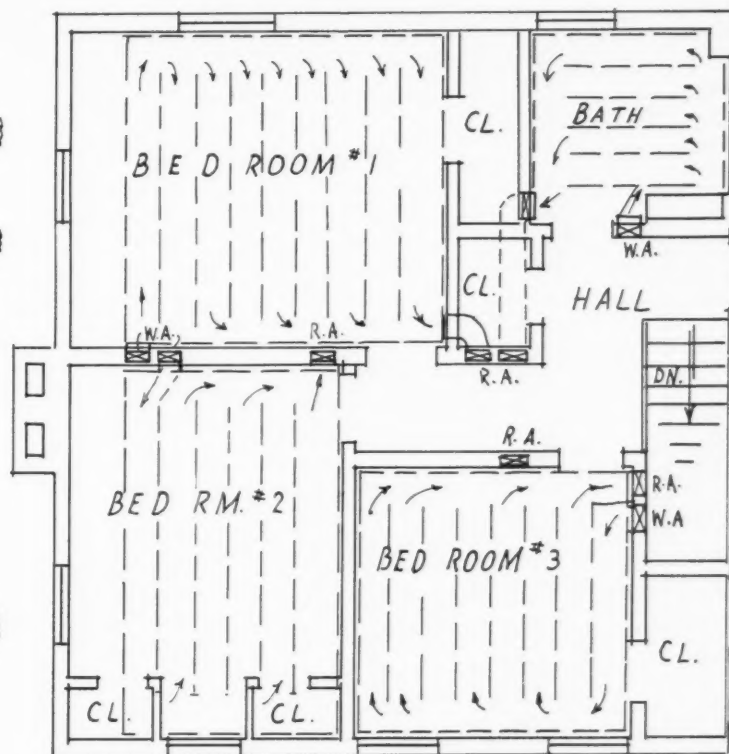
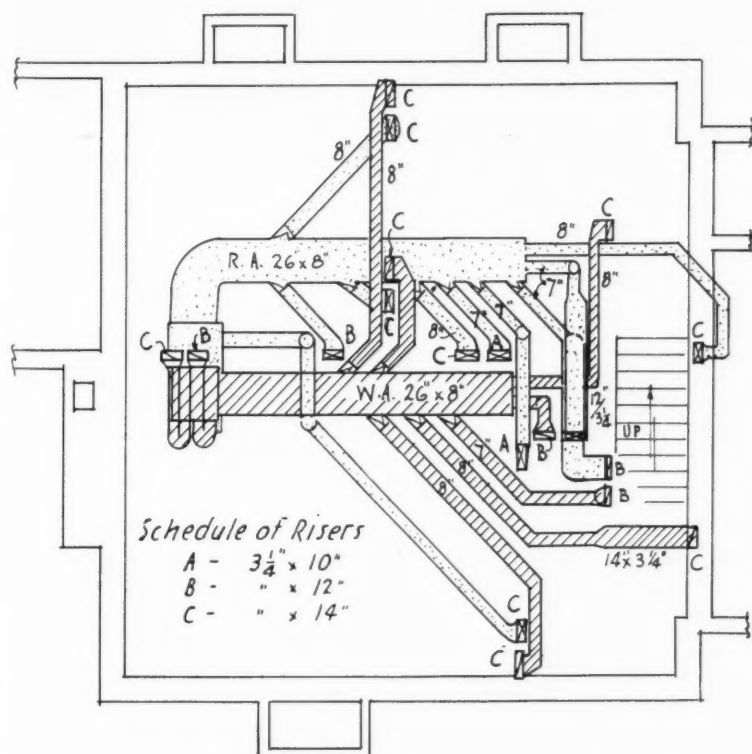
An expanded metal lath and plaster ceiling is fastened to the bottom edges of these dividers. The photographs show that the sides act as separators to divide the air into parallel streams with the air flowing through the spaces and into the common collecting header and back to the return.

The construction is explained by the company engineers—

"There are regulation joists on regulation settings. Under each joist we pasted  $\frac{1}{8}$ -inch as-

bestos strips and nailed galvanized sheet through these asbestos strips to the joists. The edges of the strips were joined to each other by the use of "S" Cleats. The sides of each sheet were formed down  $2\frac{1}{2}$  inches to meet the metal lath. Every 16 inches a small clip about 2 inches square was nailed to the joist. These formed the means of supporting the metal lath, which was wired to these clips and also through them were placed single strips of metal as the guides for the air."

It is important to note that the air leaving the supply is restricted to a single space which carries the air directly to the facing outside wall. Here



Basement piping plan and plenum plans for first and second floors of the Barber residence. Note how warm air flows down one plenum space to outside wall header where air divides into returning spaces to the return opening. The warmest air goes first to outside walls. Leader pipes are sized as for usual forced warm air volume.



Exterior of the I. C. Barber residence.

the air flows down the supply header with portions entering the formed spaces and flowing back across the ceiling to the return header where all the air is picked up and conveyed to the return opening. This air flow is clearly traced in the two floor plans.

The metal plenum for first floor rooms is not insulated; the plenum, therefore, assists in warming the second floor. But the second floor plenums have insulation placed above the metal to retard heat flow upward.

The basement plan shows that a full duct system is required. The warm air system distributes the air to risers; the return risers are also collected into a common main back to the blower. In the Barber residence the main is rectangular; the branches are round pipes of sizes as indicated.

#### Engineering Can Be Complicated

There are several interesting engineering problems involved in the design of this system. For example the temperature of the air entering the plenum. The answer is not available for the Barber house, but has been investigated in the test house. The company reports—

"During the first test run last year at an outside temperature of 45 degrees, we reduced the air temperature until constant operation was required to maintain the predetermined indoor temperature. This will be continued during this winter at colder outdoor temperatures so that we will be able to plot a curve from which can be taken the necessary panel temperature to maintain indoor conditions.

"At an outdoor temperature of plus 45 degrees and with constant operation, the temperature of the air entering the plenums throughout the house averaged 80.6 degrees F. This is an average of 11 plenums.

"At another test last winter with intermittent operation and with outdoor temperature at plus 24 degrees F. the average temperature of the air entering the plenum *during blower operation* was 116.2 degrees F. During a 24-hour run with the average outdoor temperature at 24 degrees, the blower operated six hours and fifty-one minutes during forty-two operations or an average of 9.8 minutes per operation."

#### Temperature of Warm Air Supply

The question of the temperature of the air at the return opening to the plenum is given—

"During the test mentioned above with constant operation and the outdoor temperature at 45 degrees, the average of the 11 plenums was 73.4 degrees at the discharge from the plenum.

"On the other test referred to above with intermittent operation and with the outdoor temperature at plus 24 degrees, the discharged air at the outlet of the plenum was 79.5 degrees during blower operation.

"We do not have a record of the temperature of the air entering the fan, but inasmuch as the return risers are all on inside walls and as the skin temperature of those walls has never fallen below 70 degrees, we do not believe the entering air to the blower would ever drop to below 65 degrees."

On the question of how the volume of air introduced into the plenum of each room is determined—

"In our Test House we went through a very complicated method, but in Mr. Barber's home we merely used a cfm that would have been used for forced warm air heating and it is proving very satisfactory, although that is not a scientific method and eventually we hope to develop a more accurate means, but less complicated, than the one we employed in the Test House.

#### Calculating Panel Heating Effect

"In the Test House we first calculated the Btu loss from glass, walls and infiltration and divided this into the panel to get the Btu emission per square foot of panel. The mean radiant temperature of the unheated surface was then calculated and from that and the surface panel area, the required panel temperature was figured. Next, the temperature drop through the panel was calculated and then the average panel air temperature required was calculated. The next step was to calculate the heat loss upward from the panel into the second floor from the first floor panels and into the attic space from second floor panels. The heat gain in the second floor rooms from the panel under was deducted from the net Btu loss of those rooms.

"The next step was to take the panel farthest from the unit, calculate the temperature drop from the panel to the blower unit in the basement and then from a pre-determined temperature of the air at the plenum of the unit in the basement we calculated the entering air temperature into each individual panel. The next step was to then calculate the cfm required and the riser size.

"Observations made at our test house where some of the second floor rooms have insulation under the floor and others do not, indicate that the floor temperature rise does not exceed 1 or 1½ degrees in the uninsulated floor above that of a floor with insulation beneath it."





Typical, small St. Louis houses (\$5,000-\$8,000) built by the thousands during the last several years.

## Shop vs. Field Fabrication of House Duct Systems

ST. LOUIS and surrounding suburbs has, for several years past, been one of the country's most active home building areas. In this period several thousand homes have been built and sold—an especially active market being the small house selling for around \$5,000.00 to \$8,000.00.

The heating systems installed in these houses have been predominantly warm air—practically all forced warm air—and, because of a favorable gas house heating rate, approximately one half of all furnaces installed use gas as the fuel.

To install these thousands of furnaces an interesting type of heating contractor has come into existence. This contractor specializes in heating—he does no sheet metal work except gutter work on the houses he heats—ventilating systems, air conditioning system duct work, architectural sheet metal work, blow pipe work are completely absent from his plan of operations.

This contractor, judged by shop standards for the volume of work handled or by the requirements of the contractor who does all types of sheet metal work and heating, operates with a very minimum of equipment—mostly hand oper-

ated machines—from a shop which could not handle large job sheet metal contracts because of a lack of floor space and equipment. Despite this seeming handicap, some of the most active of these St. Louis shops cut and fabricate up to or more than 300,000 pounds of sheets in the course of a year and show a gross dollar volume exceeding \$150,000 a year.

As might be expected, among the several dozen shops of this type in St. Louis, there have developed a few shops each doing well over \$100,000 gross volume each year and installing from 200 to 800 furnaces each year. Four firms, in particular, have expanded into organizations of this caliber and will do, this year, probably 400, 400, 500 and 750 furnaces respectively. The 750 units organization installs mostly gravity furnaces.

Of further interest in this situation is the fact that two of these shops fabricate everything in the shop ready for erection and two others fabricate everything on the job. Each has good reasons for following its selected procedure and firmly believes that its method is the cheapest, speediest, most profitable and best adapted to volume operation.

### *Weis-Ryan Fabricates Everything in the Shop*

To show the procedure, two shops were selected and their methods studied, typical installations were photographed along with samples of the duct work. These two shops are—Weis-Ryan Heating Company which fabricates everything in the shop (except on large residences or apartments) and Adams Furnace Company which fabricates everything on the job.

Before Weis-Ryan finally decided to make everything in the shop, they followed the practice of making some things in the shop, some things on the job, letting mechanics cut and fit. At the same time, the office also set up a complete cost system in order to determine whether they could make pipe and fittings cheaper than they could buy them and whether labor was higher or



lower on shop fabricated vs. field fabrication. This cost survey finally showed that their lowest costs came from pipe and fittings made in the shop—providing standardization could be applied to sizes and jobs and simplification could be adopted to reduce sizes to a minimum.

Both standardization and simplification have now been developed to such a degree that one Weis-Ryan job looks like every other job and the number and variety of sections and fittings has been reduced to the point where practically all necessary items for several hundred installations could, if necessary, be produced in one continuous run through the shop.

Standardization has been extended thus—all wall stack is galvanized iron in  $3\frac{1}{4}$  by 10, 12 or 14-inch size made in 8-foot lengths. Wall stack sections are made up by a shop crew and by all mechanics whenever installation is slack. The sections are papered according to the ordinance; a standard register box and register frame is attached and the complete unit placed in stock. One of the photographs shows such a stock pile awaiting delivery.

Where standardization—and simplification—has created the greatest saving is in the fittings. Practically the entire Weis-Ryan fitting stock is shown in one photograph of seven fittings plus another photograph of one cold air, one warm air register head and the galvanized iron face frame. The pieces making up the line of fittings are—90-degree branch elbow; 45-degree branch elbow; square throat elbow; 90-degree main elbow; 8 inch deep offset to duck under beams; twisted offset transition; 90-degree short elbow to join branch to stack and the register box.

All of these fittings are made up in quantity for stock. The usual construction is Pittsburgh

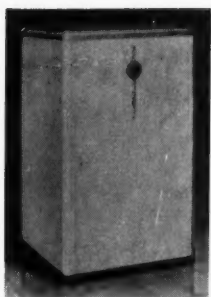
Above—Exterior of typical St. Louis four-family apartment. This is a Weis-Ryan installation. Two furnaces have wall stack mains—two others have standard square piping. At left, top to bottom—1) Mains, double, each  $3\frac{1}{2}$ -in. deep. Uses more metal. 2) Straight-up plenum and  $3\frac{1}{2}$ -in. mains. 3) Standard square pipe mains (right) and returns (left). 4) Spread plenum with square mains and returns.



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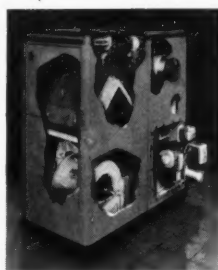
WATERBURY SEAMLESS Furnace (800 Series) is the original and most highly developed leakproof welded steel warm air furnace. 22 proved advantages. A size for every need.

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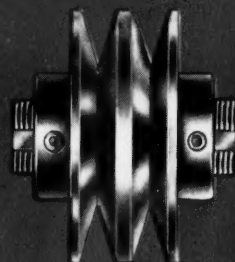




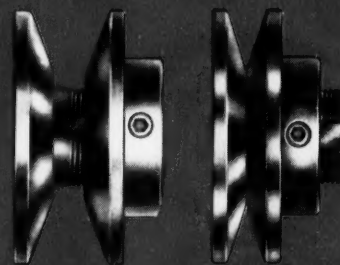
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**V-PULLEY PROBLEMS**



Cast Iron  
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Cast Iron Two-Groove  
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Cast Iron Single Groove  
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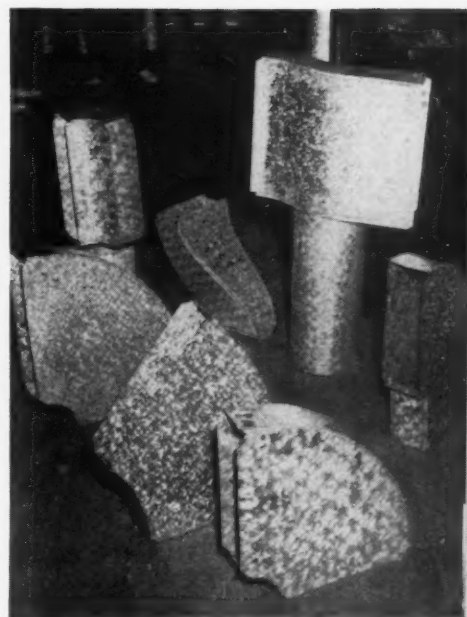
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2915 South Wabash Ave., Chicago, Ill.



Left—Weis-Ryan mechanic putting a standard elbow together. Center—Parts for the same elbow are all production made. Right—Group of Weis-Ryan standard fittings—in foreground, three 3½-in. elbows; Center, offset (to drop under joist); right, takeoff for branch from main.

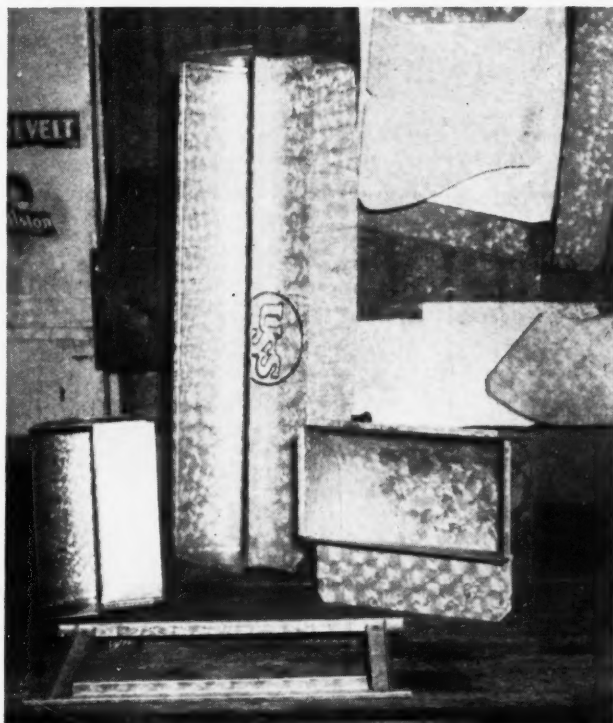
lock on four corners, to make which a lock forming machine is employed. Some of the photographs show the construction clearly.

Standardization is also extended to main and branch straight sections—the usual Weis-Ryan duct system is 8 inches deep. Plans and heat loss calculations are developed by the furnace manufacturer in cooperation with Weis-Ryan and in accordance with the Technical Code. Installation photographs show the resulting construction.

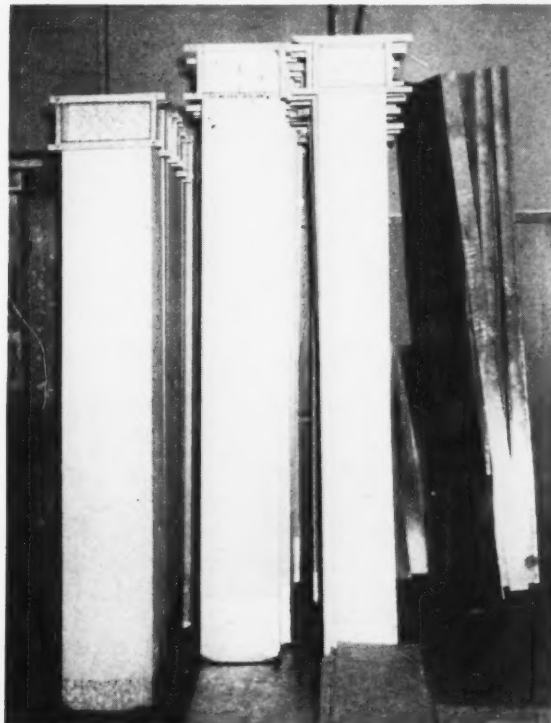
The customary procedure once a job starts through the shop is for one of the firm members to visit the house as soon as the frame work is

ready for rough in and spot the openings. In St. Louis all cutting is done by the carpenters. As the holes are marked for cutting, the actual framing is compared with the builders floor plans and measurements are made to determine where the furnace is to set, where the mains and branches are to run and these pipe locations are drawn in on the blue or a pencil layout is made. This piping layout determines dimensions.

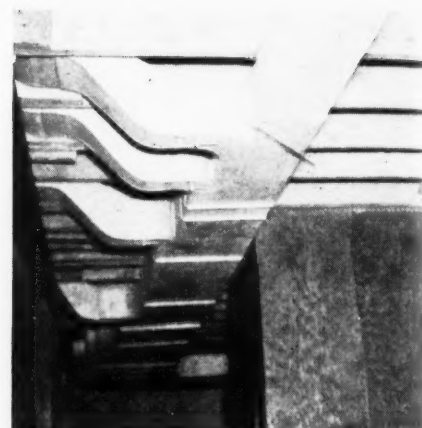
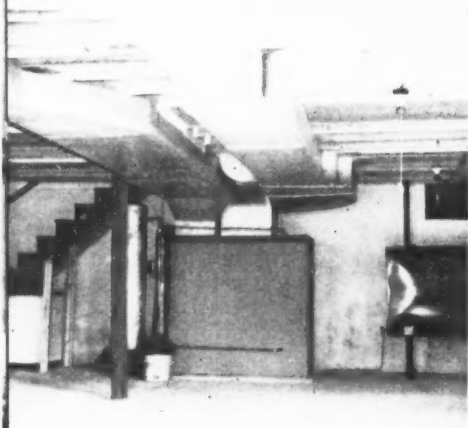
Back in the shop the runs of pipe are drawn in exactly and from this layout the necessary fittings—by type and number—are entered on the job sheet. At the same time the number of main



Weis-Ryan standard C. A. head in background. Left, center, another but smaller C. A. head. Right, center, standard W. A. register box. Foreground, galvanized iron register frame made in quantity at low cost.



Weis-Ryan standard wall stacking papered and with register head and register frame attached ready for delivery to any job. All standard sizes and construction.



A popular type of house in St. Louis is the "Ranch House" shown in the center—low, no basement, large windows, exposed. Weis-Ryan apply their standard pipe work including fittings as shown left and right. Note branch takeoffs, neat appearance, and use of simplified fittings.

duct, branch duct, stack, straight sections are determined; the registers are counted; the cold air runs are indicated and the number of sheets required to pan the joists or the length of return air full duct section required is figured. The final result is the material list to be filled from stock.

Field work generally is divided between crews although in the Weis-Ryan organization no one man or no one crew becomes exclusively a specialist. One crew may rough in the job, another

crew, or perhaps the same crew at a later date, hangs the basement pipe work; a crew sets the furnace and places the usual straightup Weis-Ryan plenum (see photographs) unless another type is specified—gas connections are made by others; electrical work is by electricians; stokers or conversion oil burners are installed by Weis-Ryan since the company also sells automatic firing devices.

By these methods Weis-Ryan can and does install 350-400 systems a year.

## *Adams Fabricates Everything on the Job*

Adams Furnace Company, with just as many years experience, doing just as large a volume, installing in houses of the same general type, even working for the same builders, firmly believes in doing everything possible on the job. For the usual one floor bungalow Adams will fabricate 90 percent of the sheet metal work on the job—making up only standing seam drive cleats and register boxes and frames in the shop. For the popular St. Louis two or four flat building (separate heating plant for each apartment) Adams will fabricate 80 per cent of the sheet metal work on the job—making the drive cleats, the 10-foot stack sections, register boxes, register frames, in the shop.

Adams reached his decision to make most of the work on the job through a minutely detailed cost record. In the beginning Adams made up in the shop and made up on the job, and compared costs against purchased items. Adams, however from his cost records, found that fabricating on the job offered the cheapest labor cost, saved material, eliminated all chances for error through pieces which didn't fit and got the most work from his crews.

When Adams Furnace Company was a small shop doing a few installations a year, the company began keeping these detailed material and labor records. These records showed that there was more waste in shop made pipe work and more

time spent running back and forth than appeared on the records of job-made pipe work. So Adams purchased a portable 4-foot brake and began doing all work on the job. Now the company has four 4-foot portable brakes and follows the same procedure.

Simplification is used by the Adams company in order to reduce special fittings to the minimum. For example, all elbows and turns are easy sweeps—no square elbows are permitted. Duct depth has been established at 8 inches and this 8-inch depth is carried through the take-offs and branches (see photographs). Mains are sized to velocity and according to the Practical Code increasing main width by 10 per cent as each branch is connected working back to the furnace.

Further, Adams likes high side wall registers and probably 90 per cent of all Adams jobs are high registers using 22½-degree downward deflecting registers. Stacks are 3¼ by 12 inches, papered.

A real effort is made by the company to make plenum construction as simple as possible and unless there are particular obstructions the standard Adams plenum is a long sweep elbow (see photographs) off the top of the casing. The cold air return is identical.

The flat sheets for all pipe work are delivered to the crew in quantities Adams has found from his records are required for that particular type



and size of house. Mains and branch sections are made in 3-foot lengths from one sheet if possible using a brake-formed Pittsburgh on the single seam.

A finer point of the Adams duct work is that the firm is one of only two shops in St. Louis that cross-brakes all 3-foot sections on all sides, for both warm and cold air pipes. This plan eliminates all possible booming noises.

Cold air returns are panned joists but, whenever price permits, Adams uses a U-Shaped liner of galvanized iron so the joist space is full metal with the two sides and top in one piece and the bottom pan each nailed in place and not forming a self supporting duct. The two bottom seams are made air tight by stripping with adhesive tape (see photographs). Standing seam drive cleats stiffen the bottom.

#### Job Sheet Requirements Surprisingly Uniform

The problem of delivering enough sheets—not too many, not too few—has been worked out from extensive records, as mentioned. These records show that over several years the usual St. Louis five room bungalow consistently takes 17 sheets of 36 by 120 or 32 by 120-inch material. These same records show a surprising uniformity in labor requirement of 12 to 14 hours labor for two men to make and install the basement pipe work. By openings, these same records show consistently two hours of labor for each opening. Dozens of job records seen show this uniformity of material and labor.

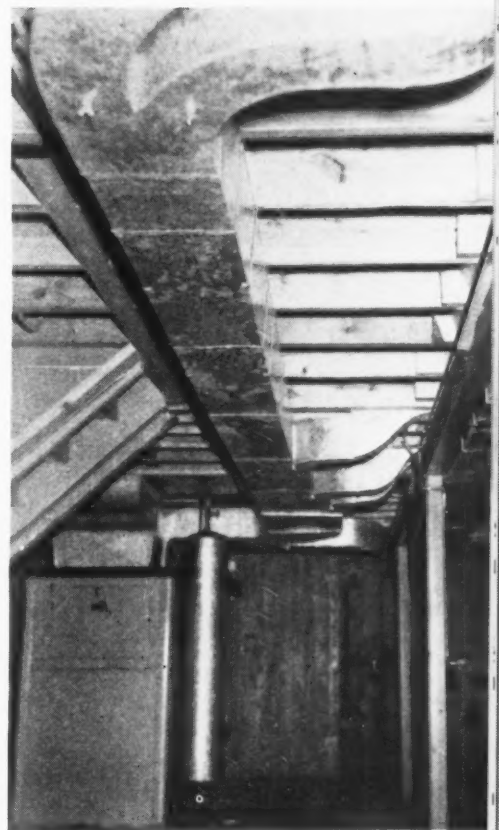
The Adams field work is handled by two-men crews in so far as possible. This year there have been four two-man roughing in crews and four two-men basement crews. The roughing in crews also do any gutter work in the contract. Either the rough in or basement crews will set the registers and cold air faces. The two-man crew is usually a team of mechanic and helper.

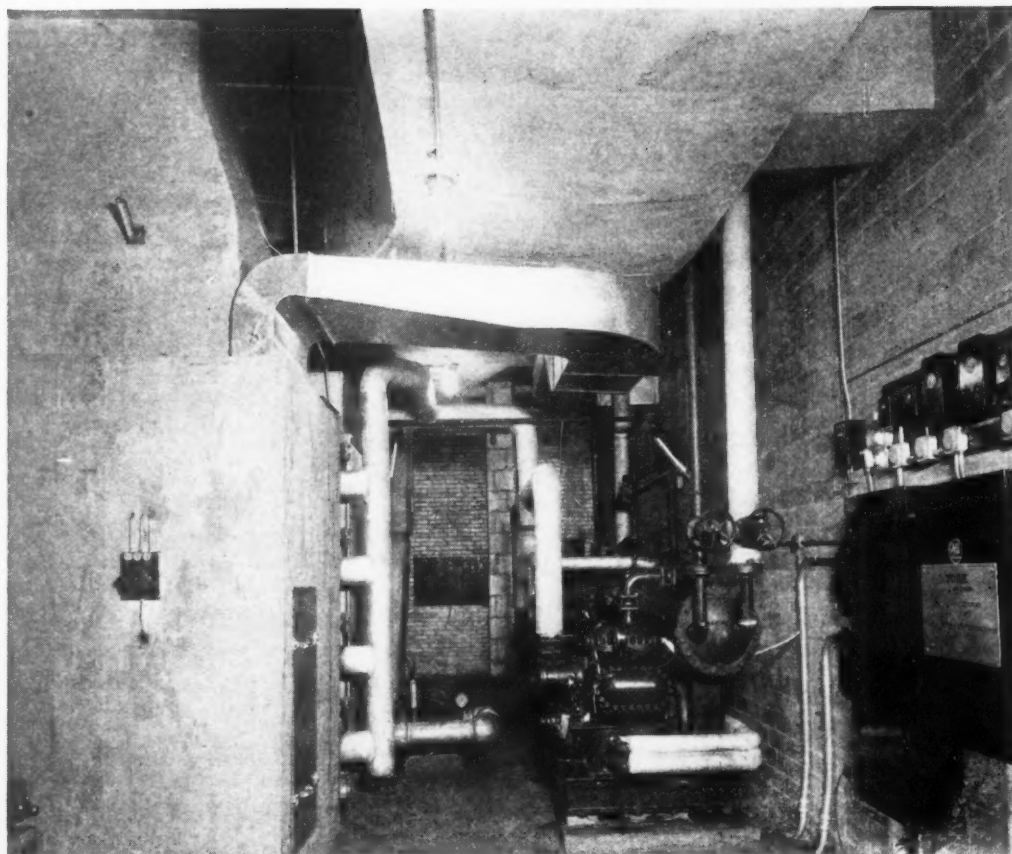
Adams has solved the heating plan and heat loss cost problem by handling furnaces made in St. Louis and getting from the manufacturer a plan of the heating layout and a heat loss sheet. He has, consequently, no engineering expense and by virtue of hundreds of jobs each year the manufacturers' plans take into account the basic principles of the Adams methods so that the plans received are just as much Adams layouts as though the company drew its own plans. This method has the further advantage, the company believes, of making the furnace manufacturer responsible for the heat loss and pipe sizes.

These methods have made it possible for the Adams Furnace Company to handle approximately \$125,000 gross volume of heating work a year, with a relatively small number of mechanics and helpers and a minimum of shop space and equipment. Incidentally, practically 100 per cent of the Adams installations are forced warm air and about 50 per cent of the installations use gas as fuel.



Three views of a typical Adams Furnace Co. "everything made on the job" installation in a small residence. Adams delivers only flat sheets, portable brake, bench and hand tools; the mechanics lay out their own patterns, make all fittings, make all straight pipe (note every section cross broken) make up all cold air pipe, make up the plenum—and erect the pipe work. Adams does send some wall stacking and cleats. Records show this procedure is as economical as shop fabrication—for Adams.





Second floor equipment room showing two 60 HP refrigerating machines, blower and washer and beginning of store duct system. All apparatus is York Ice Machine Corp.

## Air Conditioning a Woolworth Store

**E**ARLY in 1940 the F. W. Woolworth Company opened its new store and building in Springfield, Ohio, a handsome, two-story structure completely air conditioned—following a thoughtfully developed plan for improvement of existing stores by either erection of completely new buildings or the complete reconditioning of buildings already occupied.

One of the “must” improvements for these stores is air conditioning—particularly summer cooling—F. W. Woolworth Company has found that cooled stores keep summer sales at high levels and insure customer comfort. Since cooling has been found so advantageous in the firm’s own stores, the company follows the policy of including equally flexible air conditioning for the offices and stores included in each new or reconditioned building whenever this is possible.

In order that air conditioning shall be as satisfactory as possible throughout all the stores in the country, the company places all air conditioning planning, inspection and approval under one engineer in New York. This executive checks, guides, correlates all air conditioning and ventilating system design; he inspects each installation and passes on its satisfactory operation. By these means F. W. Woolworth Company has

been able to co-ordinate their installation experience on systems installed throughout the United States with resultant improvements on all new installations as they come along.

As the plans indicate, this Springfield, Ohio, project—as on all other projects—required study in order to find a satisfactory solution. In this Springfield building there is the Woolworth store on the first floor. Also on the first floor, occupying space along the side street is a jewelry store, a dress shop and a hosiery shop. The F. W. Woolworth store occupies most of the basement space for stock rooms, kitchen, supply room, employees’ rest rooms, mechanical equipment, etc. The second floor has offices (rented out) around the two street sides; the store’s offices are on the back face. The central area is a roof for the first floor, thus making a light court as shown on the second floor plan.

So far as air conditioning is concerned, the chief problem is to get flexibility so that offices used when the store is closed, or extra high heat loads (doctors, perhaps) or small stores which may have very high loads in proportion to floor space—can all be conditioned exactly to occupants’ desires or needs, at any time of the day or during the year—without making the cost of

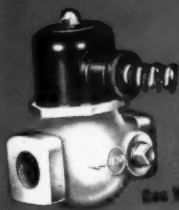


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Penn's engineering and manufacturing resources are being devoted without stint to our nation's defense. Busy as we are for the Army, Navy and other defense industries, we recognize our continuing duty to the great heating industry, and the vitally im-

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Penn controls for all heating applications are still available—and Penn pledges its utmost effort to maintain its service to the makers, sellers and installers of heating equipment on the best basis possible during our national emergency.

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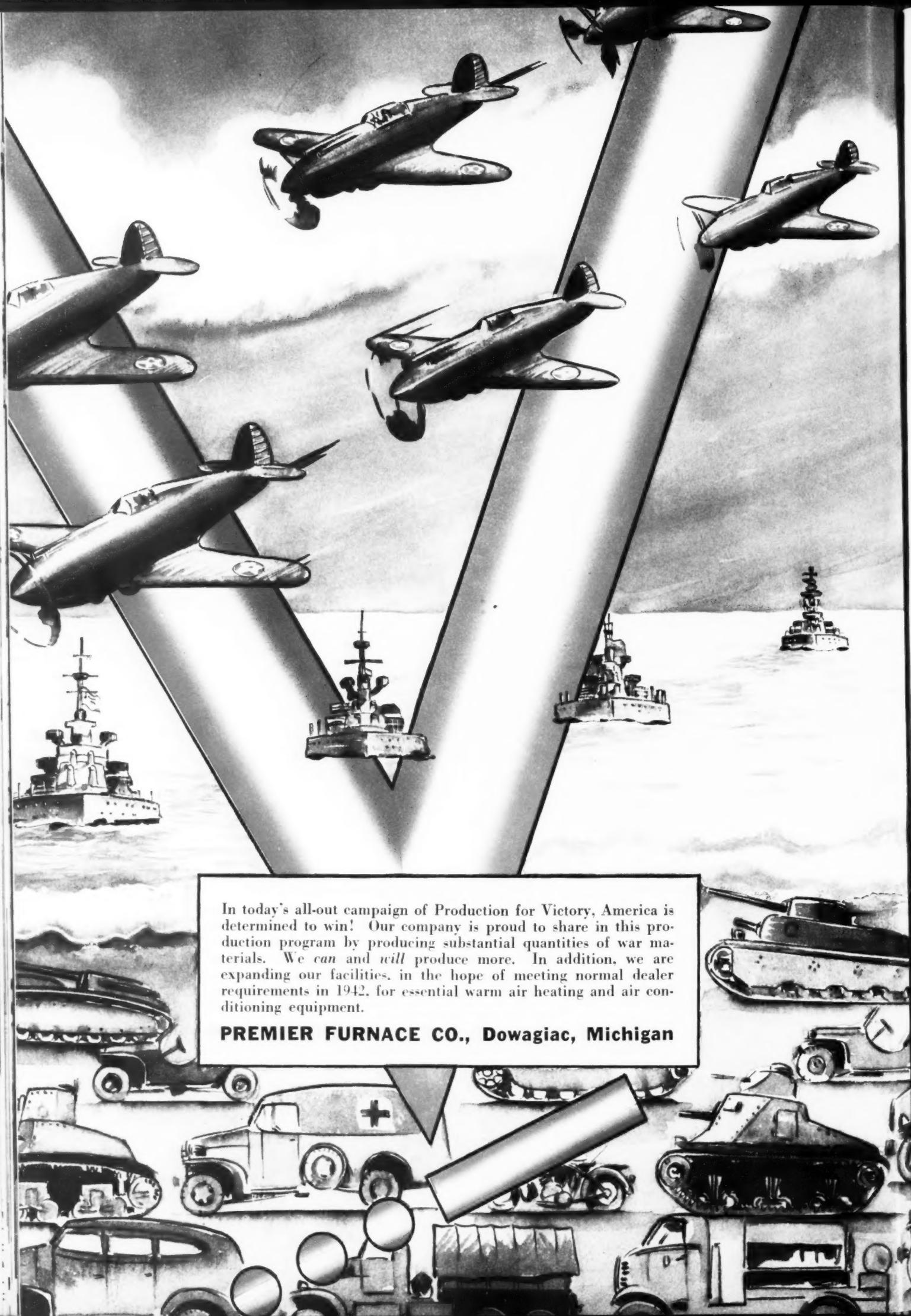
*Penn Electric Switch Co., Goshen, Indiana.*

# PENN CONTROLS

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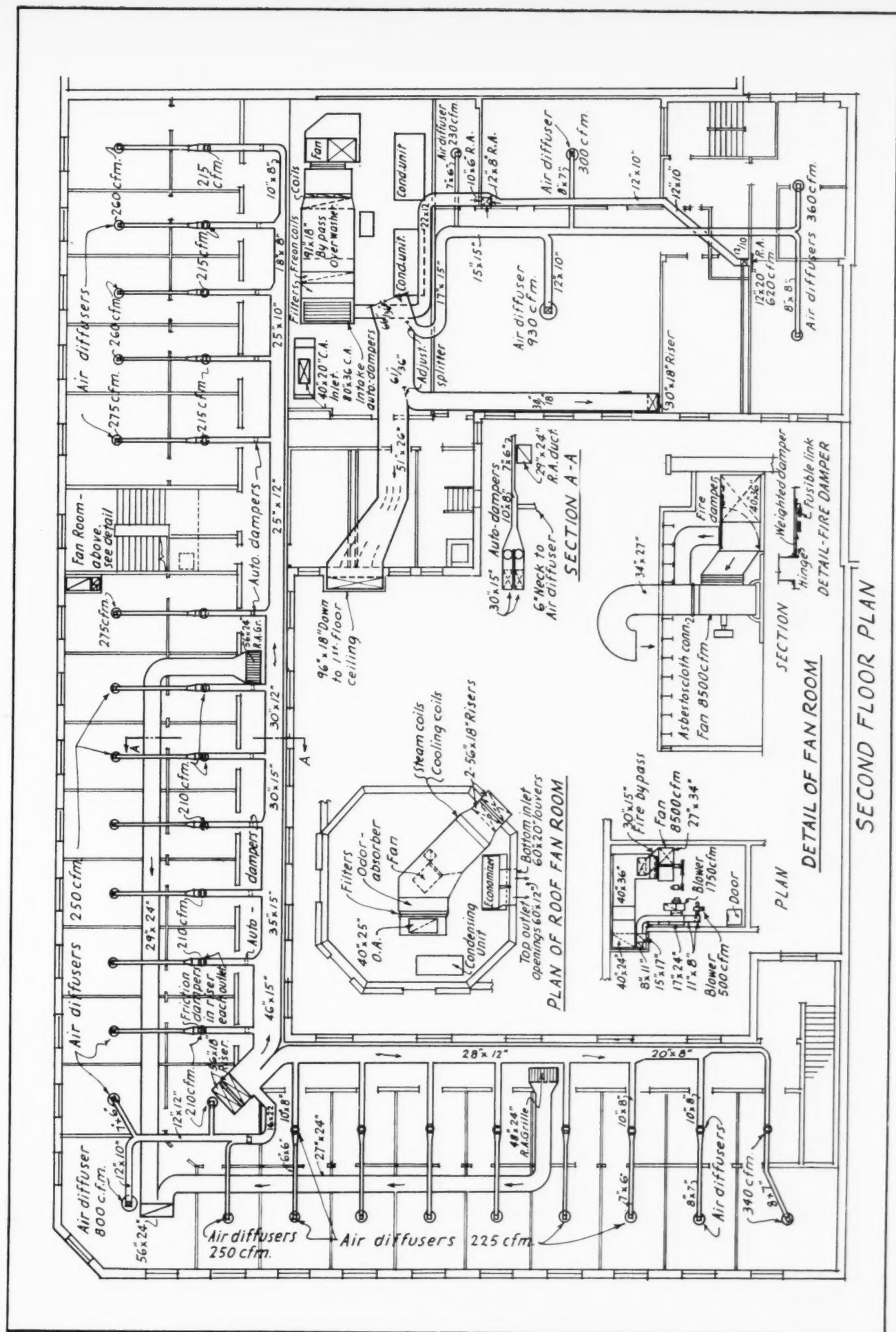
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In today's all-out campaign of Production for Victory, America is determined to win! Our company is proud to share in this production program by producing substantial quantities of war materials. We *can* and *will* produce more. In addition, we are expanding our facilities, in the hope of meeting normal dealer requirements in 1942, for essential warm air heating and air conditioning equipment.

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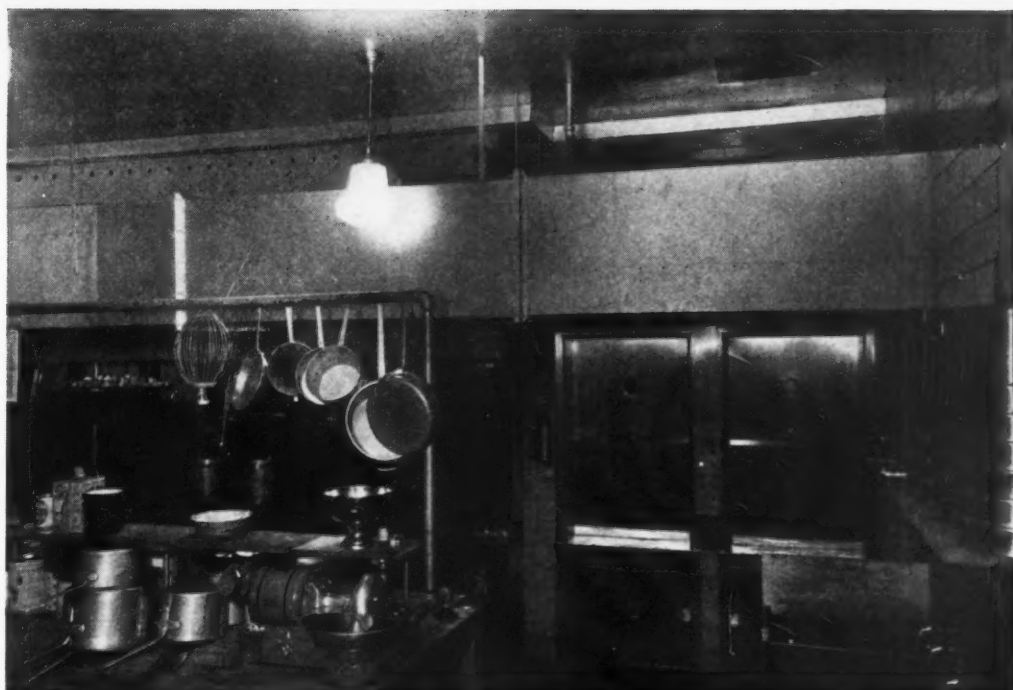


Second floor duct systems; store system equipment room; second floor equipment pent house; air distribution control for leased offices.





Looking toward kitchen range (see basement plan opposite) and part of the hood duct leading to exhaust fan. Air exhausted is replaced by basement air taken into the kitchen through a bank of filters placed in the kitchen partition. See details opposite. Woolworth engineers remove grease by placing a bank of filters at the entrance to the range hood exhaust duct.



cooling and conditioning exorbitant.

The solution applied to the Springfield store was several conditioning systems. The store, of course, has the largest cooling load. The basic design conditions for the store and leased space are 80 deg. D.B. and 50% R.H. at 95 deg. D.B. outside and 78 deg. wet bulb in summer and 72 deg. D.B. at 0 deg. outdoors in winter. The system for the store required 111 tons of refrigeration obtained by using 120 GPM of 67 deg. deep well water and two 60 HP refrigerating machines; 26,080 cfm., of which 10,140 cfm. is fresh air, were required for the store. The equipment for the store is placed on the second floor. (See second floor plan.)

The second floor leased offices have their own system and apparatus located in a pent house above the second floor, and a double duct system—one duct carrying warm air, the other cooled air so that each tenant can maintain his own conditions. The beauty parlor has an individual system with ducts. The jewelry store, likewise, has an individual system. The dress shop, hosiery shop, bus driver rest room, each has a unit air conditioner.

All apparatus was furnished by York Ice Machinery Corporation. York also designed the systems, subject to Woolworth approval. The sheet metal work involved in the air conditioning systems and the sheet metal work required for the ventilating systems to be described later was fabricated and installed by The Mannen & Roth Company of Cleveland.

#### Duct Fabrication and Erection

A total requirement of 44,000 pounds of galvanized iron in gauges from 26 to 14 were used in the ducts for the air conditioning systems, the ventilation systems, equipment housings, etc.

To handle the duct work contract, the Mannen & Roth Company decided to fabricate all sheet metal work in its Cleveland shop and truck the

sections and fittings to the building in Springfield. In order to make installation as simple as possible, and to eliminate all unnecessary cutting and fitting, the sheet metal contract was carefully analyzed and listed to find all duplicating pieces. A production schedule was planned so that erection could keep up with the other trades.

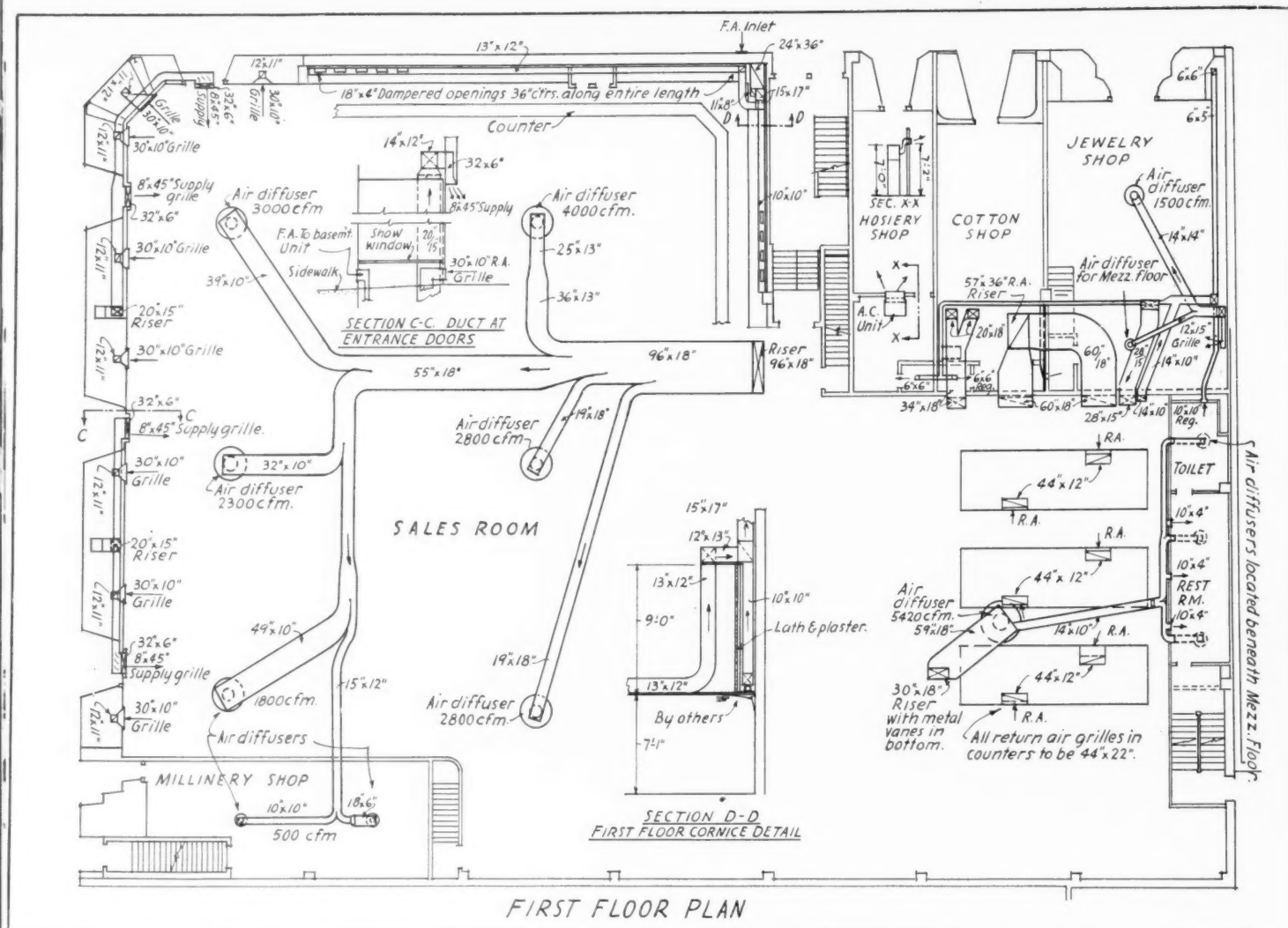
The plans show that the condensers, fan, coils and washer for the Woolworth store are located to the rear of the second floor in a special equipment room. One large and one small supply duct carry to about the center of the building and then drop down to the store main supply line which branches across the ceiling toward the two street sides. This main and the branches are concealed behind a furred down first floor ceiling.

Main duct sections and sections of the large branches were fabricated as either two or four pieces depending on size, using standing seams for cross connections and double locked horizontal seams. These pieces, with seams run, were shipped to the building from Cleveland. The pieces were put together on a rail on the job and erected from high horse scaffolds as full sections, 8 feet long. The cross standing seam cleats were made in Cleveland, cut to proper size. Angle iron hangers and reinforcing was placed on 4-foot centers.

Smaller branches were made in two pieces, using the same types of seaming and were erected in a like manner. The smallest branch sections were delivered complete ready for connecting.

The plans show that final air delivery is through high velocity diffusers; sizes being indicated on the first floor plan.

The design of the supply ducts for second floor offices afforded a splendid opportunity for duplication since all branches from the hall mains to the diffusers are the same size, length, and have openings at the same places. Mannen & Roth took advantage of this duplication and fabricated in Cleveland identical fittings and pipe in full section (each branch composed of two pieces)



Ducts serving air diffusers in the store are concealed behind the plastered ceiling. The plan above shows duct sizes and diffuser volumes. Note, also, the special exhaust system for the lunch counter. To replace air exhausted from the basement kitchen some air is taken out of the store and passed through small conditioners and into the basement (see text and basement plan).

ready for erection from horse scaffolds.

As stated, the second floor office system provides both warm and cooled air, at all times available to each tenant. How this was provided is shown in detail A-A. The main which traverses the corridor is a double pipe of identical size. Opposite each suite of offices a stub is taken off each main with a mixing damper in each stub. These stubs join at identical fittings to make the single branch to the diffuser. Since the main stubs are identical, as are the branches, it was possible to provide these fittings ready to hang.

#### Individualized Office Control

There are 24 office spaces on the second floor. Each space has its own thermostat which controls the mixing dampers to furnish a mixture of warm and cold air and each thermostat also controls a steam heated convector in each space thereby taking care of all seasons of the year.

The problem of possible odor transmission was solved by installing an odor absorber in the main air stream at the air conditioning equipment.

The operation of this second floor system is as

follows—recirculated and outside air is first filtered, then the mixture passes through the odor absorber after which the fan picks up the air and discharges part through the cooling coils and into the cold air duct and part into the warm air duct. The mixing dampers proportion the two volumes. Return of the air is through door grilles which admit air from offices into the main hallway, where two grilles located in the hall ceiling pick the air up and convey it back to the air conditioning system. The fresh air duct is large enough to accommodate 100% of the fan's capacity and does so under automatic control, thereby providing an economy in operating cost.


Air returned from all first floor spaces is withdrawn through grilles located in the bases of counters.

#### Basement Kitchen Ventilation

The restaurant and soda counter kitchen for preparation of food is located in the basement, as shown on the basement plan. Air from this room is ventilated through a hood over the ranges (5,000 cfm.) and a hood above the dishwasher

(Continued on page 218)





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*In the fight for victory, our first duty is to co-operate with our Government in any requirement that may be assigned to us. This we will gladly do, just as you, too, will gladly co-operate in any way that may be required of you.*

*And, when government requirements have been met, our next obligation will be to you — to stand shoulder to shoulder with you and, by supplying you with all of the heating equipment we can produce for you, help you in your efforts to supply your customers.*

*We make this pledge because we realize that upon you, rests the responsibility for proper installation of needed new equipment and servicing existing units — tasks that cannot be entrusted to anybody but heating specialists like yourselves.*

*We know that our policy of dealing only through the established heating trade is sound. That is our policy now and it will be our policy when this emergency is over.*

*J. M. Carth*  
SALES MANAGER

NORGE HEATING AND CONDITIONING DIV., BORG-WARNER CORPORATION

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facturing methods have kept prices at levels where dealers can compete and still make their full legitimate profit.

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**NORGE HEATING AND WINTER AIR CONDITIONING UNITS  
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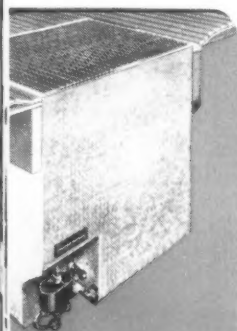


# NORGE HEATING AND WINTER AIR CONDITIONING UNITS

*Famous Members of a Famous Family*

## NORGE OIL-BURNING FURNACE

### MODEL OC-60—60,000 B.T.U. Bonnet Output

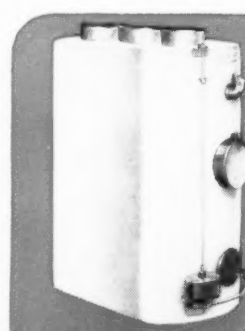


Modern "under-floor" vaporizing unit, needs no furnace room. Extends down only 36 inches, controlled from the room above through floor grille. Low first cost (about the same as a space heater), no duct work or pipes. Economical. A Norge "package," comes ready to install.

"L"-shaped heat distributor with 25-40% more heating surface and Permolain finish inside and outside to resist heat, acids, soot, rust; down-draft Whirlator feeds air into heart of flame; automatic chimney draft regulator; constant-level oil meter; 36" high, 28" wide, 40" deep.

## NORGE OIL-BURNING FURNACE

### MODEL OB-60T—65,000 B.T.U. Bonnet Output



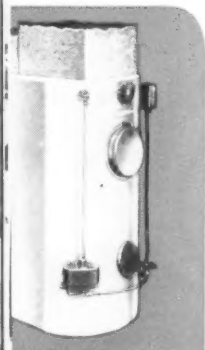
Gravity circulation vaporizing unit for basement installation. A "package" unit, ready to set in place and connect to ducts, and oil supply. Low first cost (about the same as a space heater) and low installation cost. Economical.

"L"-shaped heat distributor with 25-40% more heating surface and Permolain finish inside and outside to resist heat, acids, soot, rust. Automatic chimney draft regulator; constant-level oil meter; manual or thermostatic controls; 44" high, 26" wide, 40" deep.

## NORGE OIL-BURNING FURNACE

### MODEL OA-63

#### 70,000 B.T.U. Bonnet Output



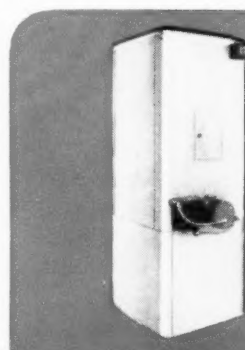
Modern, semi-automatic vaporizing unit for installation in ground floor utility room, pit or basement. Actually costs less than many an old-fashioned furnace.

Silent, rubber-mounted blower, manual or thermostatic controls; 800 C.F.M.; "L"-shaped heat distributor with 25-40% more heating surface and Permolain finish inside and outside to resist heat, acids, soot, rust; mechanical draft booster available as accessory; 44" high, 24" wide, 40" deep.

## NORGE OIL-BURNING FURNACE

### MODEL OD-70

#### 70,000 B.T.U. Bonnet Output



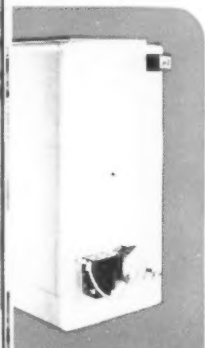
Specifically designed for government agency contracts.

Modern, vertical pressure vaporizing unit; 500-900 C.F.M. Only 26" square, can be installed 2" from wall either side. Converts to winter air conditioner by adding filters and humidifier. Long life Permolain heat exchanger. Automatic draft supplied by 2-stage fan; low voltage thermostat; combination fan and limit control; safety float valve; fast, low-cost installation; factory wired; all controls fully automatic; meets every government code regulation including CS-75-39; 67" high, 26" square.

## NORGE OIL-BURNING WINTER AIR CONDITIONER

### MODEL OE-80

#### 80,000 B.T.U. Bonnet Output

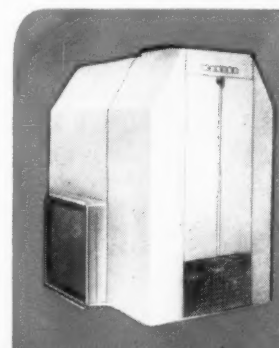


Modern, horizontal pressure vaporizing unit, 900 C.F.M.; for installations requiring slightly greater capacity than average small home. Approved for basement or utility room installation within 2" of either sidewall and 9" at the back. Long life Permolain heat exchanger. Automatic draft supplied by 2-stage fan; low voltage thermostat; combination fan and limit control; safety float valve; safety warp switch; fast, low cost installation; all controls fully automatic; meets every government code regulation including CS 75-39; 50" high, 26" wide, 47" deep.

## NORGE OIL-BURNING WINTER AIR CONDITIONER

### MODEL O-90

#### 90,000 B.T.U. Bonnet Output



Fully automatic pressure atomizing type unit. 950 C.F.M.; automatic draft by "pull-through" fan; 1-20" filter, single power unit; centralized visible servicing, low operating cost; quick low-cost installation; factory wired; automatic humidifier; horizontal firing tunnel; spiral "ramp" economizer; electric ignition; meets government code regulation CS-75-39; 53 1/2" high x 33" wide x 49" deep.

## NORGE OIL-BURNING WINTER AIR CONDITIONER

### MODEL 120

#### 120,000 B.T.U. Bonnet Output

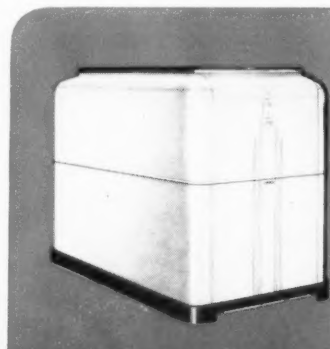


Fully automatic pressure atomizing type, oil-burning unit. 1200 C.F.M.; automatic draft by "pull-through" fan; 2-16 x 25" filters; with automatic safety by-pass single power unit; centralized visible servicing; low operating cost; quick low-cost installation; factory wired; factory tested; automatic humidifier; horizontal fire tunnel; spiral "ramp" economizer; electric ignition; basement or utility room installation; meets government code regulation CS-75-39; 62" high, 40" wide, 57" deep.

## NORGE OIL-BURNING WINTER AIR CONDITIONER

### MODEL BO-9

#### 165,000 B.T.U. Bonnet Output



Modern, brilliantly engineered, deluxe unit for the larger home. Efficiency rating 84%; 1500 C.F.M.; 2 filters with automatic safety by-pass; pressure atomizing oil burner; low operating cost; quick low-cost installation; factory tested; automatic humidifier; horizontal fire tunnel; spiral "ramp" economizer; electric ignition; 64" high, 40" wide, 68" deep.

Send for detailed information regarding these Norge units.

*Continued on Page 14*

**NORGE**

# A Short, Short Design Method

By Henry Aronson

Field Engineer, Premier Furnace Co.

THERE isn't any argument that a heating plant carefully and completely designed and executed is superior to one that is just "guessed" in. There is, however, some question as to just how practical it is to make exacting calculations in all cases, particularly in the smaller homes that make up the majority being built today.

Structural conditions necessarily limit stack and head sizes and registers must be standardized if inventories are to be kept down, and under present conditions, to even insure deliveries. With this in mind, the writer is presenting a reasonably short method of calculating duct and register sizes for the smaller homes. The method is based on the simple proposition that we are limited to a certain few sizes of fittings and is therefore figured out on a basis of the maximum capacities of these components.

The original use for this method was for arriving at estimates without making a complicated layout, and for converting gravity jobs to forced air. The results have been checked against those

from a more complex calculation and have been found to be very close, particularly when the more detailed jobs were adjusted to use standard fittings and registers.

This method is only recommended for smaller residences and not to large, complicated jobs with exceptionally long or unequal runs. The final results are very close to those that would be found if the installation was figured from the Technical Code with a register temperature of 135 degrees, an .08 static pressure line, and an equivalent length of 75 feet. It goes without saying that if it appears to the designer that the conditions will vary greatly from these limits, this method should not be used. However, the majority of five to seven room houses can be figured within these limits.

## "Key" Is Capacity of Registers and Stacks

As this method is mainly a statement of the capacities of ducts and registers that can be used with standard construction, it is in the form of a few simple tables. The idea is limited to the sizing of ducts and registers and the tables are prepared in such a way that any recognized BTU method may be used to determine heat losses. The Standard Code is one of these methods and the tables have been prepared so that they can be read from inches of gravity as well as from BTU losses. The use of the method is extremely simple, but to make it clearer a house plan (Figs. 1 and 2) is being figured all the way through and a data sheet has been developed for this purpose. This is shown in Fig. 3. To find the heat loss, the Standard Code method has been used as most designers are familiar with this and a great many feel it the simplest of all methods.

The house being figured is a one-story type of standard frame construction with a full, unfloored, attic and in an area with a design temperature of 70 degrees at 0. The first thing to do is fill in the top of the data sheet with the room names and their dimensions. Next the factors should be placed in the factor column. By referring to the Standard Code, it will be found that the factor for infiltration is 800, which is placed in the line for "cubics corrected." The factor for single glass is 12.6; for a frame wall 57, and

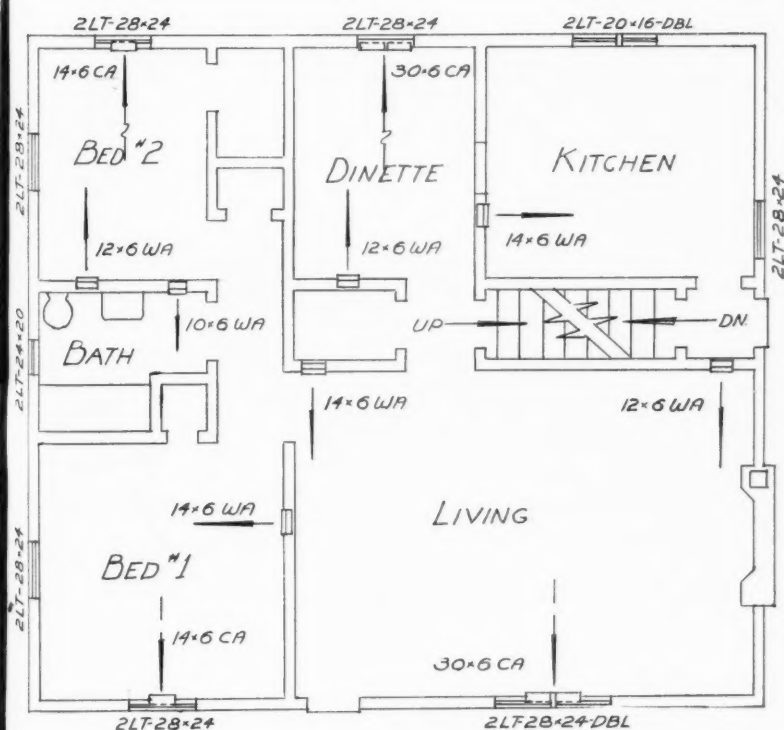


Fig. 2—Plan of a typical, small house in which a gravity or fan circulated system is installed by the author's method.

# DATA SHEET

Heating Contractor.....City.....Date.....  
 Owner.....Address.....City.....

Room Dimensions		Living 20½x14x8½		Bed No. 1 11x11x8½		Bath 8x6x8½		Bed No. 2 10x8x8½		Dinette 10x8x8½		Kitchen 12x10x8½	
	Factor	Data	Result	Data	Result	Data	Result	Data	Result	Data	Result	Data	Result
Cubics		2440		1029		408		680		680		1020	
Air Changes		1		1½		1		1½		1		1½	
Cub. Corr.	800	2440	3.05	1544	1.93	408	.50	1020	1.27	680	.85	1530	1.91
Exp. Wall		294		187		51		153		68		187	
Glass Area	12.6	40	3.17	22	1.74	9	.71	22	1.74	11	.87	23	1.82
Net Wall	57	254	4.45	165	2.89	42	.73	131	2.29	57	1.00	164	2.87
Exp. Floor													
Exp. Ceiling	40	287	7.17	121	3.02	48	1.20	80	2.00	80	2.00	120	3.00
Total			17.84		9.58		3.14		7.30		4.72		9.60
A—Correction %													
B—Multiplier		9		9		9		9		9		9	
Gravity Inches		161		86		28		66		42		86	
C—Btu.		17840		9580		3140		7300		4720		9600	
D—Cfm		130-138		145		75		112		75		145	
D—Round Pipe		7-8		8		6		7		6		8	
D—Wall Stack		12/3¼- 14/3¼		14x3¼		10x3¼		12x3¼		10x3¼		14x3¼	
D—Rectangular Duct		8/5-8/6		8x6		8x4		8x5		8x4		8x6	
D—Register		12/6- 14/6		14x6		10x6		12x6		10x6		14x6	
Return Air Cfm		276		138				138		276			
Return Air Register		30x6		14x6				14x6		30x6			
Return Air Stack		2-Studs		1-Stud				1-Stud		2-Studs			
Return Air Rect. Duct													

A—Add or subtract 1½% for each deg. temp. diff. above or below 70 deg.  
 B—Multiply "A" by 9 if first floor room—by 6 if second floor room  
 C—Multiply "A" by 1000  
 D—From table

Temperature Difference 70°  
 Register Location, Baseboard  
 Equipment, 20" Air Cond. Unit

Room	Btu.	Cubics	Cfm.
Living...	17840	2440	273
Bed No. 1	9580	1029	145
Bath....	3140	480	75
Bed No. 2	7300	680	112
Dinette...	4720	680	75
Kitchen...	9600	1020	145
Total....	52180	6329	825

for the ceiling 40. These are placed in the factor column opposite the proper descriptions as shown on the data sheet. As the furnace in this case is to be hand-fired, no floor loss was considered. With a gas or oil unit it would be necessary to add a floor loss.

The next step is to figure out the actual physical data of the house and fill out the data columns for the various rooms. When this has been done, the cubics are corrected for air changes according to the code. For rooms with windows on one side, the air change is considered 1, and for rooms with windows on two sides, the air change is 1½. This factor, or multiplier, is written in the line under the cubics (air changes) and the corrected cubics are written in the line below that.

The living room, as an example, contains 2440 cubic feet, with windows on one side, making an air change of one, so the corrected cubics are the same as the actual cubics. The factor is 800, so 2440 divided by 800 gives a result of 3.05 which is placed in the result column. The glass area is 40, which is divided by the factor 12.6, giving a result of 3.17. The net wall is 254, which is divided by the factor 57, giving 4.45. The exposed ceiling is 287 feet, the factor is 40, with a result of 7.17.

The results for the room are then added, giving a total for the living room of 17.84. This is placed

in the TOTAL line on the data sheet.

The same is done for all the other rooms. The kitchen and bedroom have windows on two sides, so the air change multiply is 1½, which is used to correct the actual cubics.

This job is being calculated on the basis of a 70-degree temperature difference, so no correction ("A" on the data sheet) is necessary. If the temperature difference were greater than 70 degrees, 1½% should be added for each degree over 70, and if less than 70 degrees 1½% must be subtracted for each degree under 70.

Next the total of the result column is multiplied by the proper multiplier to obtain gravity inches. For first floor rooms, multiply by 9, for second floor rooms, multiply by 6. For more details see the Standard Code. This step is not actually necessary, but is shown to make comparisons. There are also times when it is desired to size a job both ways. In this case the multiplier is 9 all the way through, as all rooms are on the first floor. The living room product is 161, which is the square inches of gravity leader pipe area needed if the room should be heated by gravity.



**TABLE 1**  
**Warm Air Duct and Register Sizes**

Hourly Btu. Loss	Gravity, Inches 1st—Floor—2nd		Cfm.	Round Pipe	Stack	Rect. Duct	Register	
							Bsbrd.	High
0-6000	0-54	0-36	0-90	6	10x3 $\frac{1}{4}$	8x4	10x6	10x4
6001-8750	55-79	37-47	91-130	7	12x3 $\frac{1}{4}$	8x5	12x6	12x4
8751-10500	80-95	48-63	131-155	8	14x3 $\frac{1}{4}$	8x6	14x6	14x4
10501-13500	96-121	64-81	156-200	8	14x4	8x7	14x8	14x6

The next step is to convert gravity pipe area to BTU. As the Total line in each result column is really BTU in thousands, it is only necessary to multiply this by 1000 to obtain actual BTU. Where the figures are carried out to two decimal points, it is only necessary to add one zero and drop the decimal point. This is done for all the rooms.

#### Pick Pipe Sizes From Table 1

Refer now to TABLE 1. The BTU column shows the range of BTU losses and corresponding gravity inches that the ducts and registers in the same line will supply. The proper line to use is found by referring to the BTU or gravity inch column corresponding to the heat loss or gravity requirements for the room being sized. If the job has previously been figured according to a BTU method or the Standard Code, the foregoing heat loss calculations may be ignored, and the duct and register sizes read directly from the table. If the job was figured by the Standard Code and the full figures are not available, it will be advisable to convert the gravity inches to BTU. This is done by multiplying first floor inches by 111, and second floor inches by 166. This is not absolutely necessary, but will be more accurate when obtaining CFM.

In order to use the table, simply find the bracket, in terms of BTU or square inches, in which the loss of the room falls, and read along the line to obtain the duct and register sizes. These are entered in the proper columns of the data sheet as shown. Where one room has more heat loss than is shown in the table, it must be divided to provide two or more runs. This can be done by dividing equally, or dividing it into runs of different sizes.

In the case of the living room, one-half the loss was slightly more than the capacity of the components shown in line 2 of TABLE 1, so it was

divided to use one 12x6 register (from line 2 of table 1), and one 14x6 register (line 3). The full capacity (8750 BTU) of a 12x6 register was subtracted from the total (17840 BTU), and the remainder (9090 BTU) was the required capacity of the second branch. This falls within the limits described in line 3 of TABLE 1.

There could be several different ways of handling this particular room; the above is one such. In some cases it may be inadvisable to use two different sized registers, but in this case, with baseboard registers, the difference would not be noticeable. When registers of two different sizes are used, the larger should be used on the longer run, except where one of them is closer to an unusually bad exposure, in which case that one should be the larger.

In cases where the quantities itemized in the table call for a duct or stack larger than the construction will permit, it will be necessary to divide the loss similarly. This is particularly true with second floor runs where a 12x3 $\frac{1}{4}$  stack is usually the maximum. Bedroom No. 1, with a loss of 9580 BTU was sized from the third line of TABLE 1 (14x6 register), the bath from the first line (10x6 register), and so on for all the rooms.

#### Pick CFM From Table 3

In finding CFM, this may be read directly from TABLE 1, by using the maximum CFM shown for each loss bracket. This will not make a great deal of difference in the duct size and will provide an additional safety factor. The objection is that it will give a fictitious total, larger than actually needed, and may cause confusion in sizing the unit or fan, so TABLE 3 should be referred to. Table 3 shows CFM requirements for different BTU losses, and it will be best to use it when filling in the spaces in the CFM line on the data sheet, or whatever the designer makes his record

**TABLE 3**  
**CFM Equivalents of Btu Requirements**

Btu.	Cfm.	Btu.	Cfm.	Btu.	Cfm.	Btu.	Cfm.	Btu.	Cfm.
5000	75	7000	105	9000	134	11000	164	13000	194
5250	78	7250	108	9250	138	11250	168	13250	197
5500	82	7500	112	9500	142	11500	171	13500	200
5750	86	7750	116	9750	145	11750	175	13750	205
6000	90	8000	120	10000	149	12000	179	14000	208
6250	93	8250	123	10250	153	12250	183	14250	212
6500	97	8500	127	10500	155	12500	186	14500	216
6750	101	8750	130	10750	160	12750	190	14750	220

**TABLE 2**  
Returns Through Stud and Joist Spaces

	Max. Cfm.	Register
Single Stud space.....	160	14x6
Double Stud space.....	320	30x6
Joist Space—10" by 14" O. C.....	490	

on. In the case of the living room, the shortest run is figured according to the full capacity of a 12x6 register (8750 BTU) and the longer run on the basis of the difference (17840—8750=9090) which shows CFMs of 130 and 138 respectively. In TABLE 3, if the BTU loss is not exactly equal to a quantity shown, use the next larger quantity.

The same is done for all the rooms. The totals are recorded as shown at the lower right hand part of the data sheet, and the grand total arrived at.

#### Design Trunk From Table 1

When this has been done, the design of the main duct, or trunk, can be started. If the job is to have individual round pipes, no further figuring is necessary as far as the supply side of the system is concerned. By referring to the plan, Fig. 2, the register sizes and locations can be seen. These sizes are for baseboard registers. If high wall registers were used, their sizes would be taken from the last column of TABLE 1. In this instance high registers could be located similarly to the baseboard registers, but in many jobs their location would be quite critical. On the smaller jobs, which often are taken closely, the average

**TABLE 4**  
CFM Capacities of 8" Ducts

Width.....	6	8	10	12	14	16	18	20
Cfm.....	180	270	355	460	570	655	790	875

Width.....	22	24	26	28	30	32	34	36
Cfm.....	970	1080	1145	1255	1390	1480	1600	1710

dealer will be better off to use baseboard registers. The installation is simpler, and their operation is less critical as to velocities, etc.

TABLE 2 shows the capacities to be used when stud and joist spaces are used for returns, as in this case. The capacities for the various rooms can be worked out and the returns sized accordingly, or in a house such as this, satisfactory results will be had if the total CFM is equally divided among all the returns. Here the total CFM is 825. If we use five stud spaces, each would have to carry more than 160 CFM (maximum in TABLE 2) so six spaces are used, two single and two double returns. This allows 138 CFM for each single return and 276 CFM for each double return. The doubles are located in the living room, as that room had the largest loss, and in the dinette which is adjacent to the kitchen, where no return is used. As a matter of standardization, 14x6 registers are used for single returns and 30x6 registers for the double returns.

#### Making the Plant Layout

Referring to the basement plan, Fig. 1, it will be noted that at each opening, either supply or return, the CFM has been noted. After this has been done, a line drawing of the duct system is made. The branch ducts are all sized from TABLE 1. It is of course up to the designer to decide whether the branches will be round pipe, rectangular ducts, or wall stacks, so the branches have been denoted simply by letters and their sizes shown on a table on Fig. 1.

As will be seen on the plan, the CFM have been progressively added as the duct proceeds towards the furnace unit, and the main duct sized accordingly from TABLE 4. This table is for ducts 8 inches deep; this is our selected standard size. The plan and its notations should be self-explanatory, so that no more explanation is necessary here. The unit is sized from the grand total on the data sheet, Fig. 3. Where a closed return system is used the branches are figured likewise. In this case it is only necessary to size the return main, as the branches are joist spaces.

There are, of course, a great many limitations to the use of a short system such as this. However, a system such as this, properly used, is bet-

(Continued on page 197)

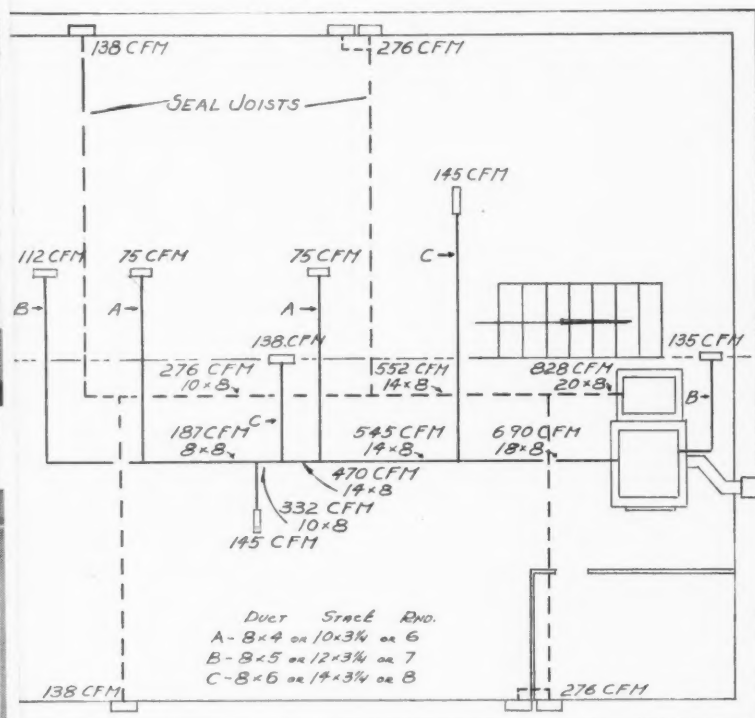


Fig. 1—Basement plan showing layout of piping for fan circulation; cfm's required in branches and main sections and pipe sizes as selected from Tables 3 and 4.

18	20
790	875

4	36
00	1710

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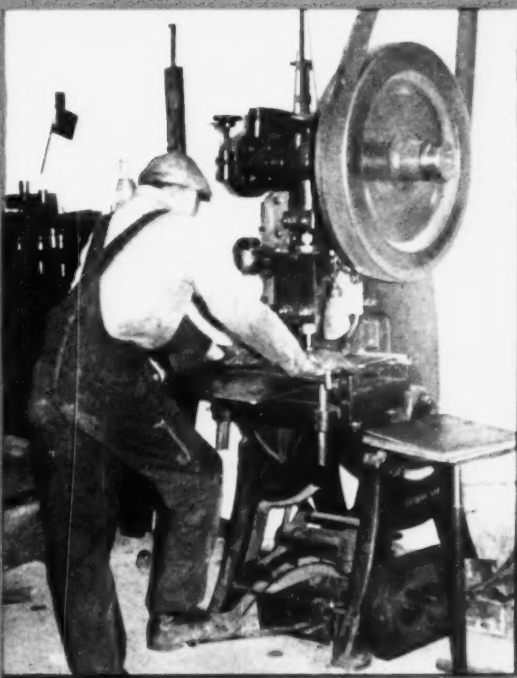




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# SHEET METAL

S E C T I O N



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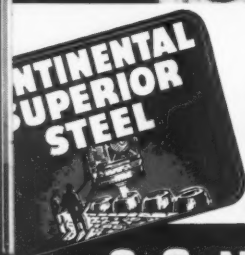


# ***SPEED PRODUCTION*** **with *SUPERIOR SHEETS!***

The illustrations here show the plant of the Weber Showcase and Fixture Co.—one of many manufacturers speeding production of government orders with SUPERIOR SHEETS. For years SUPERIOR GALVANIZED and SUPERIOR GALVANNEALED have been equal favorites in sheet metal shops and manufacturing plants. For painting, Superior Galvannealed is an ideal sheet. This "clear through" quality sheet has a heat-treated zinc coating which takes and holds fine finishes without preparatory treatment other than cleaning.

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# **SUPERIOR**



N  
5!

Showcase  
ding pro-  
SHEETS.  
PERIOR  
sheet metal  
Superior  
" quality  
holds fine  
cleaning.  
n, Ohio



Typical "merchandise" cabinet of the type described in this article with work bench, tool storage, equipment compartment—all doors locking.

## Manufacturing Procedure For A Service Station Cabinet

By Ernest E. Zideck

Instructor, Technical School, Jackson, Michigan

IN THE thousands of automobile service stations which spot the nation's streets and highways, an increasingly common item of equipment is the sheet metal fabricated "merchandise" which provides storage for equipment, grease or oil drums, clothing, lubricating "guns", tools, etc., which formerly were scattered across floors, benches or hung on nails driven into the walls.

These attractive and very practical cabinets came into popularity as a step in the process of making stations more attractive and orderly and as a means of keeping greasy tools and equipment out of the way to avoid soiling customers' clothing. Early cabinets often were merely "dummies" to hide walls or store equipment, but present units add practical service to appearance. Also important, it is believed, is the ability of such "merchandisers" to give the station that all-important atmosphere of orderly, rapid, scientific service.

These merchandisers, generally, are fabricated wholly or in the main of sheet metal, attractively and brightly finished, expensive looking and pleasing to the eyes of the customers.

A model piece of furniture of the above type is shown in the sketches and consists of a work bench flanked on each side with a cabinet containing shelves for storage of instruments, testers, gages,

special tools and similar equipment. A tool chamber above the bench between the cabinets provides orderly placement of the more common tools, within reach of the mechanic, with which he works on the repairing, testing or adjusting jobs spread on the bench before him. This tool chamber has an overhanging light compartment, usually adorned with an attractive and at night illuminated "Service" sign.

From the light compartment operates a disappearing, or folding door, which shuts off the tool chamber when the bench is not in use. The bench itself is enclosed by a corresponding "skirt" in line with the taller side cabinets; the assembled unit presenting a decorative, pleasing, expensive appearance. There are doors to the skirt, the space under the bench top can be used for various purposes, one of which is to hide away vessels, operating on movable arms, in which parts of the car mechanism are washed or cleansed.

This particular (Fig. 1) "service merchandise", is constructed of upwards of one hundred sheet metal parts, each of which is fabricated to plan, in at least one hundred pieces at a time. There is close to 500 pounds of sheet metal in the unit, the parts pre-assembled by spot welding, constructing four sub-assemblies, each processed through finishing and enameling and made ready

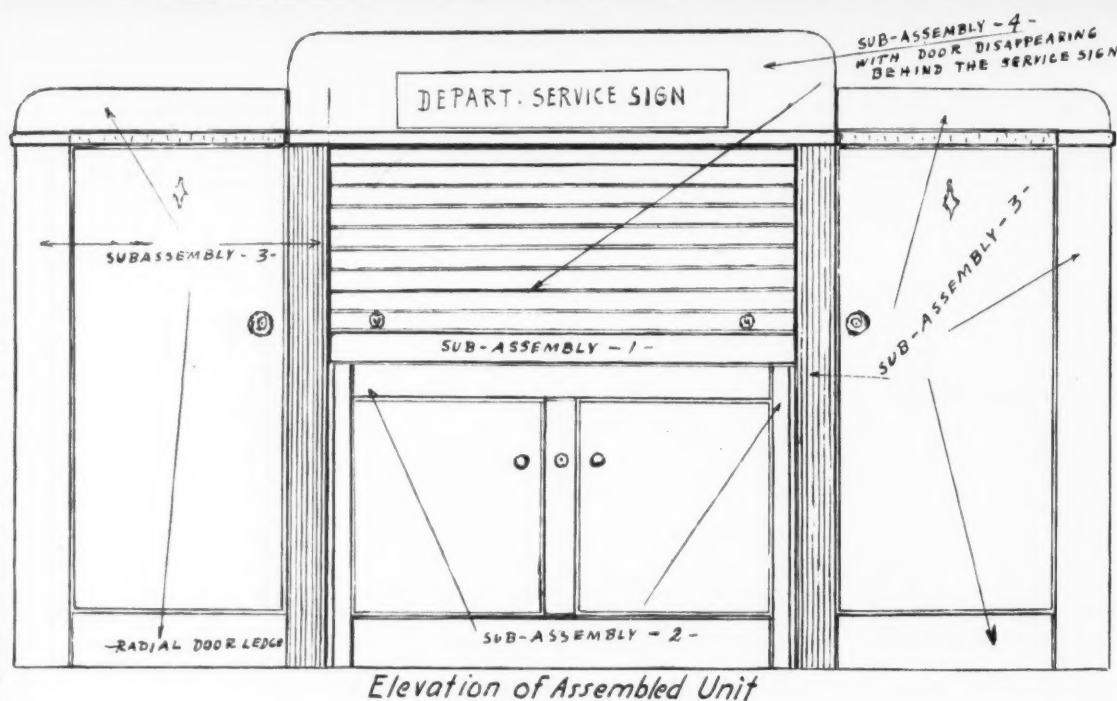


Fig. 1—Left, Elevation of cabinet with Sub-assemblies designated for reference to text. Fig. 1A shows plan of unit with framing indicated in dotted lines.

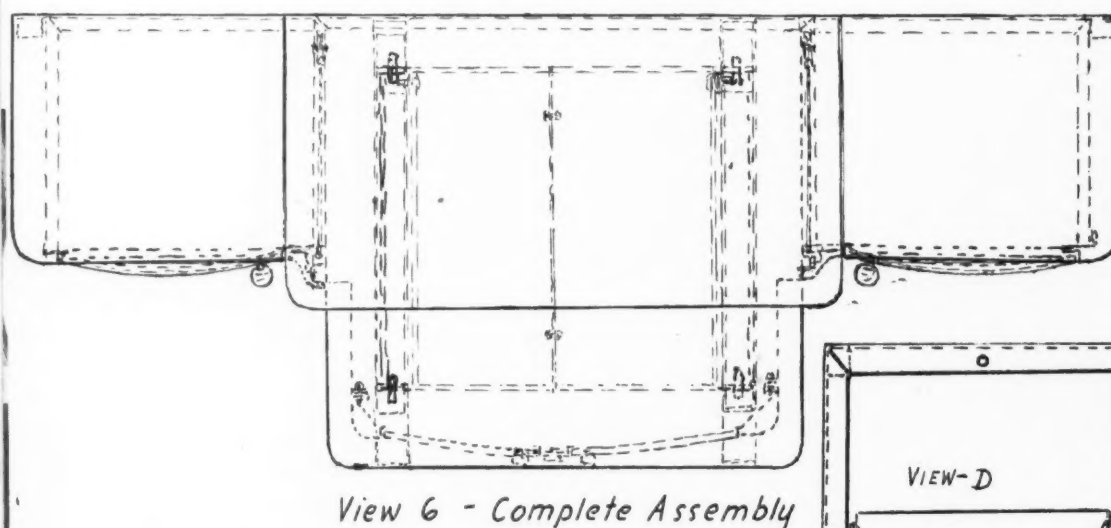


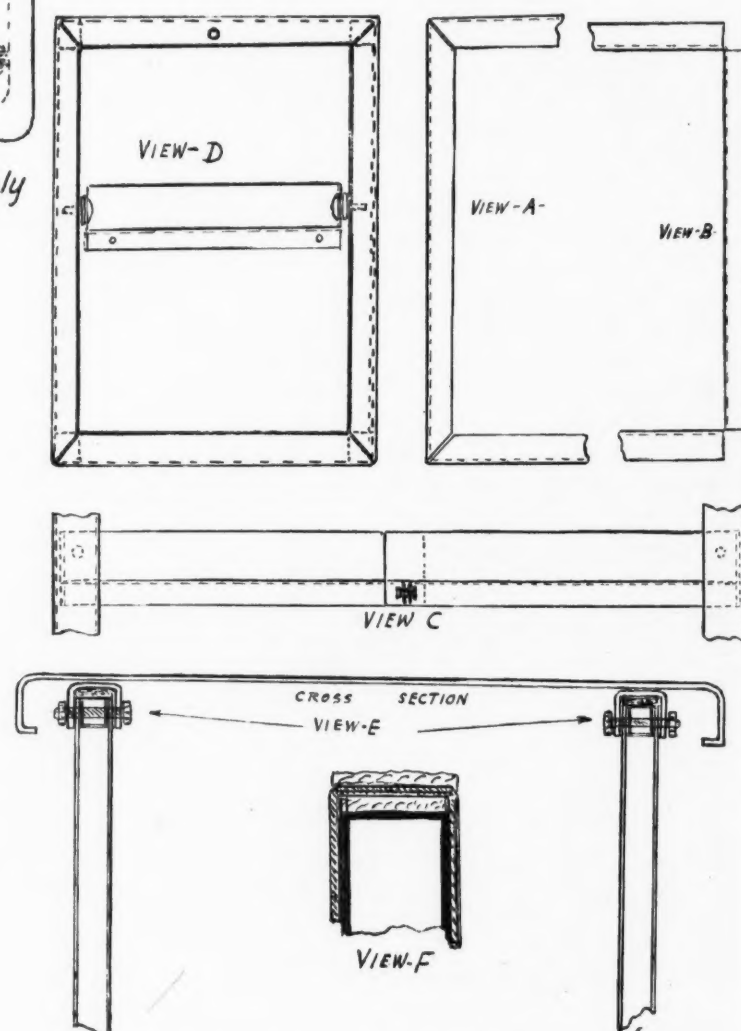
Fig. 2—Below—Plan, elevation and details of leg frame Sub-assembly Number 1. Note hinged connection of legs to bench top to permit flat shipment. Text explains construction.

for "knock-down" shipment, the final assembly of the unit being done by the service station mechanics themselves.

#### Leg Frame Sub-assembly

Sub-assembly Number 1 (Fig. 2), consists of two fabricated and welded leg frames, provided with bolt holes for fastening the legs to the bench top; each frame having hinged to its inner side a portion of a shelf that, in assembly, is bolted together, providing a rigid brace for the legs. The bench top is fabricated of 12-gauge steel, flanged on all sides for rigidity. The front and rear flanges are connected by two 12-gauge, are welded channels into which fit the tops of the leg frames. The channels are lined with  $\frac{1}{2}$ -inch thick Celotex glued to the top portions of the channels and to the top portions of the leg frames, View F (Fig. 2). The texture absorbs shocks of work being done on the bench. Two bolts through the channel and the leg top hold the assembly together.

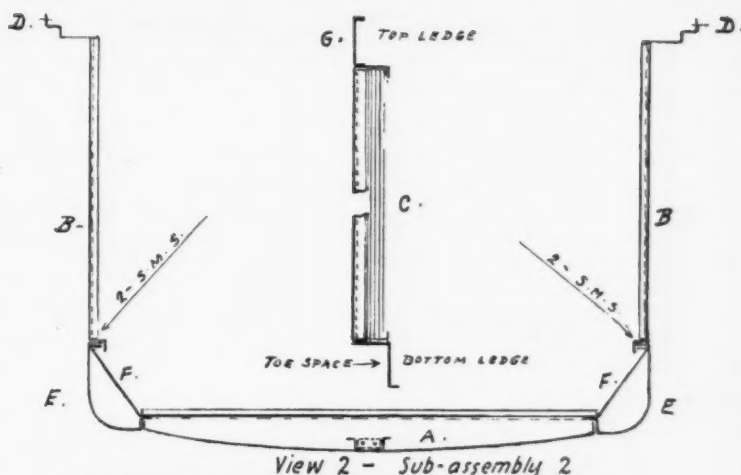
Each leg frame is fabricated of 16-gauge steel, using two strips 5 inches and 3 inches wide, respectively, notched out for corner bends as shown in View A (Fig. 2). The narrow channel, View



*Sub Assembly No. 1*

B (Fig. 2) is inserted into the wide channel, View A (Fig. 2), and spot-welded by the flanges as shown in View B, (Fig. 2), is then braked in the corners to a frame, and the joint and the corners are welded. The welds are finished off, holes are drilled by jigs, and the legs are completed for fastening to them the one-half of the shelf. This is done by the simple means of corresponding holes in the shelf walls receiving  $\frac{3}{8}$  by 1-inch rivets, are welded to walls while being inserted into the holes in the legs. Washers inserted between the walls of the shelf and the legs, View D (Fig. 2), prevent the movable shelf rubbing off the paint from the metal.

In View C, (Fig. 2), is shown the arrangement of the sectional shelf connecting the two leg frames. In View D (Fig. 2) the leg frames are inserted into the top channels and bolted. Four bolts hold together the whole bench with shelf while, for shipping purposes, the leg frames are placed inside of the flanged bench top, as shown in View E (Fig. 2).



View 2 - Sub-assembly 2  
Fig. 3—Sub-assembly 2, the skirted cabinet below the work bench, has rounded corner front and the sides are formed to connect to right and left hand Sub-assemblies 3.

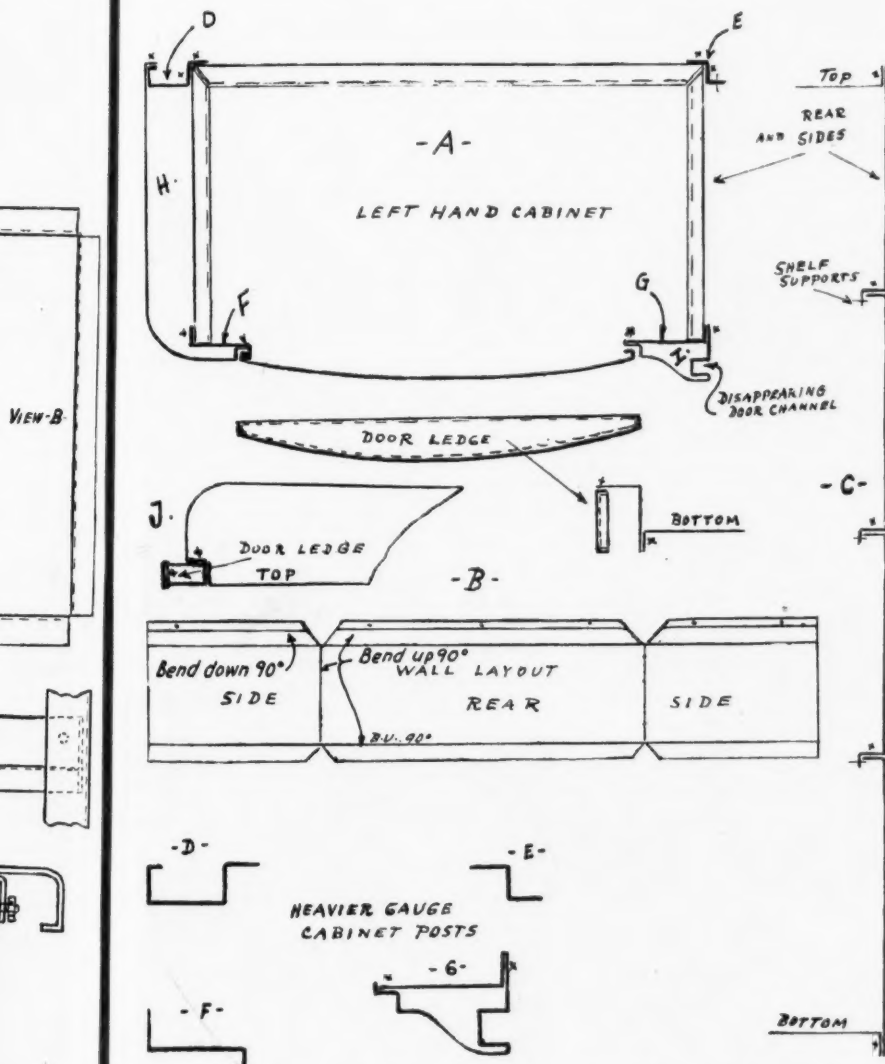
#### Work Bench Apron Sub-assembly

Sub-assembly 2, View, 2 (Fig. 3) of the drawings, is a sheet metal construction comprised of three sections which are bolted together in final assembly by four sheet metal screws through the inward flanges of the sections, as illustrated. Section A is formed to provide the bottom ledge for the two doors and toe space under the ledge, as shown in C (Fig. 3). The two corner posts, E, E, are held rigid by the two ledge extensions F, F, reaching into the capped flanges of B, B, (Fig. 3). Both the bottom ledge A, and the top ledge G, are radial in their frontal portion, corresponding to the radial shape of the two doors, which are anchored to the ledges by bolts on which they move. The door post, C, is spot-welded to the ledges, as shown. The sides, B, B, are reinforced by inward flanges, the bottom flange reposing on the floor and the top flange reaching up to the channels of the bench top. The multiform ends D, D, of the two sides, each are provided with two holes for sheet metal screws, by these means fastening to the main cabinets in final assembly.

#### Main Cabinet Construction

In View 3 (Fig. 4), is shown the construction of the main cabinets, the right hand cabinet being a counterpart of the left hand cabinet shown. The Plan, View A, shows the cabinet walls with shelf supports, layed out in B, and shown in C, to which are spot and gun welded the four corner posts, D, E, F and G, shown in details. The cabinet top and bottom are of the "inset" type, spot-welded to the walls as shown in C. The two door ledges, radial in their frontal portion, are spot-welded to the flanges of the top and the bottom, respectively, and their junctures with the cabinet posts are brazed. Crosses throughout, Fig. 4, indicate the spot and gun welds, the whole cabinet held together by these means.

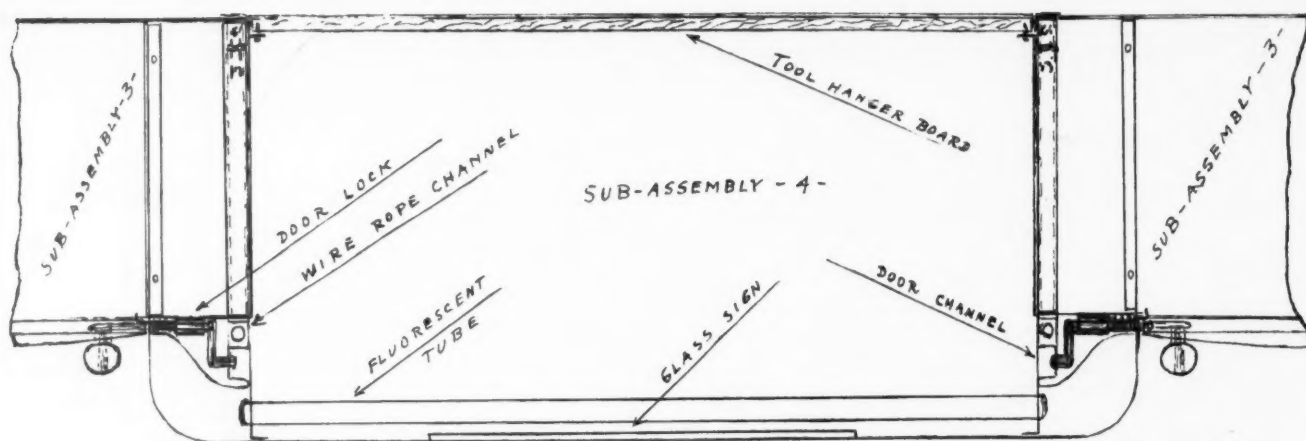
The radial section, H, extends over the top of the cabinet, as shown under J, the radials meet-



View 3 - Sub-assembly 3 - Main Cabinet

Fig. 4—Layouts of parts for main cabinet Sub-assembly 3 with plan in "A", elevation (note shelf supports) in "C" and cabinet posts in "D", "E", "F", "G". See text for formation and assembly data.





View-5 - Sub-assembly 3

ing and forming a spherical, decorative corner. Section I provides a channel for the folding door to move within it.

As shown in B and C, (Fig. 4), the downward flanges of the integral shelf supports are provided with holes for sheet metal screws by which boards may be fastened to the metal. The boards provide means for hanging tools and are an optional arrangement.

#### Swing Door and Hinge Construction

The doors are of 18-gauge smoothly rolled steel, with a 1-inch radial formation to the outside of the cabinet, the radial in the metal rendering the door rigid, preventing its warping and flapping. The door has a hinge arrangement similar to that of the rivets in Sub-assembly 1, only that in the door the rivet is replaced by a bolt, the bolts moving in a bead, somewhat on the order of a cellar bolt, sliding into reinforced holes in the door ledges, as shown in View I, (Fig. 4). The bolts operate on springs concealed in the bead of the door, the arrangement permitting a facile hanging of doors after enameling.

The door locking device is of the rotary door handle kind, as shown in View 5 (Fig. 5), the handle locked by a combination lock operating through it, the lock moving a slide which protrudes through the post of the cabinet, locking the disappearing door over the bench.

#### Folding Door Construction

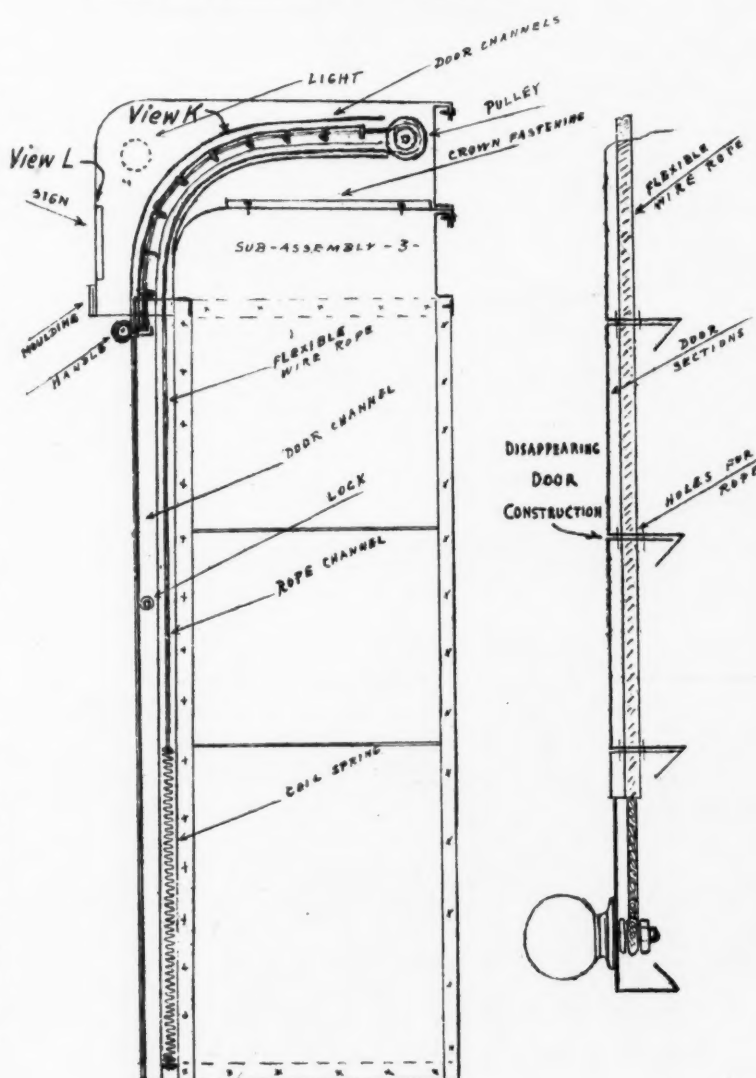
It will be noted that the cabinet here shown is constructed of a minimum of parts, these being: four wall sections which also provide the shelf supports; four posts and two ledges; bottom and top; the side radial extending over the cabinet top, forming the cabinet's finial; the frontal construction providing channel for the folding door; and a rear cover plate for the top finial. The inner rear post E, with the side flange, receives a plywood board covered on the outside with light gauge metal, the board connecting the two main cabinets.

In View 4, (Fig. 6), is detailed the arrange-

(Continued on page 202)

Fig. 5—Above—Sub-assembly 4 is the compartment above the bench and has a folding door (see Fig. 6). A wood tool board permits hooks for holding bench tools. The folding door can be locked.

Fig. 6—Below—Elevation in cross section of Sub-assembly 4 showing formation of the folding door; the door track and spring counterweight, locks and handle and section of the illuminated sign.



View 4 - Sub-assembly 4

# Copper Ornamentation on New York Schools

Outstanding new public schools in New York City area show decided preference for leadcoated, heavy-gauge, copper towers. Brooklyn Roofing Corp. recently finished three that involved 100 tons of 16-oz. and 20-oz. material. Miller & Doing, Brooklyn, furnished the ornamentation.

**A**MONG New York City's interesting new buildings are three large schools. Architecturally speaking their most prominent exterior features are unusually large and handsome towers of lead-coated sheet copper, used alone and as protection for less permanent building materials. The contracts for the sheet metal work on these structures were handled by the Brooklyn Roofing Corp., New York.

These three schools are a grade school in Bay-side; a high school in Forest Hills, Queens County, N. Y. City; and the new Benjamin Franklin High School in the heart of the city. In all of these cases the contractor furnished and applied all roofing, drainage, flashing and the ornamented towers, several illustrations of which are shown.

As design was prepared by city architects it is not surprising that general construction fea-

tures more or less resemble one another. Similitude, however, is far from duplication.

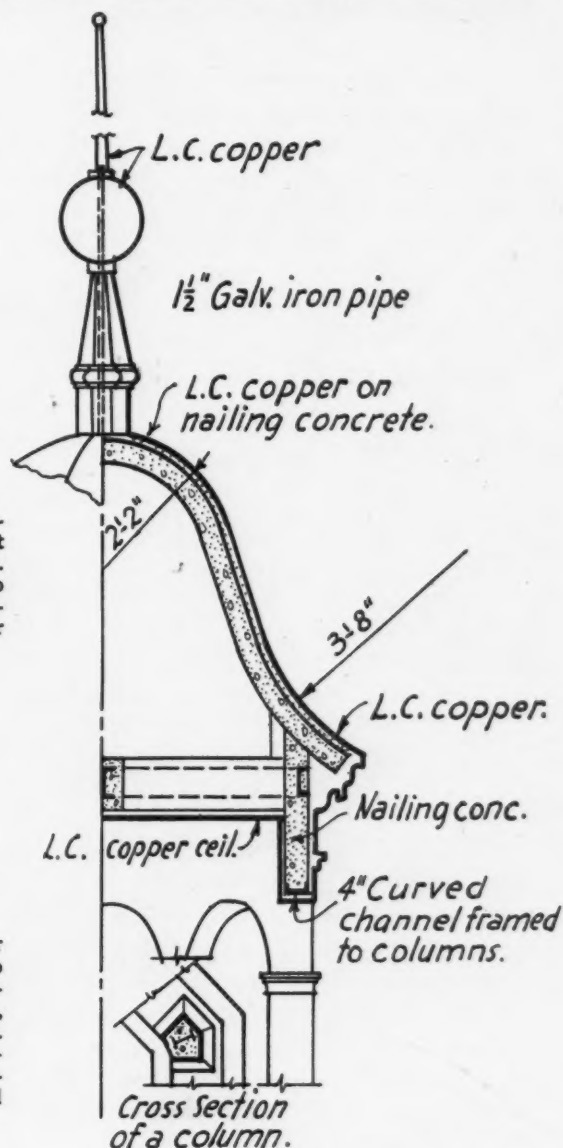
Forty tons of leadcoated and bright copper work were used on the Forest Hills High School, where 12 tall, vertical columns in simple arrangement form the ornamentation. The sheet metal work, in the main, lacks the embellishment of the Franklin High School. In addition to the columns there are four large corner pylons of hollow 20-oz. copper, parts stamped by Miller & Doing, Brooklyn, N. Y., manufacturer, plus considerable stamped moulding and miscellaneous other pieces.



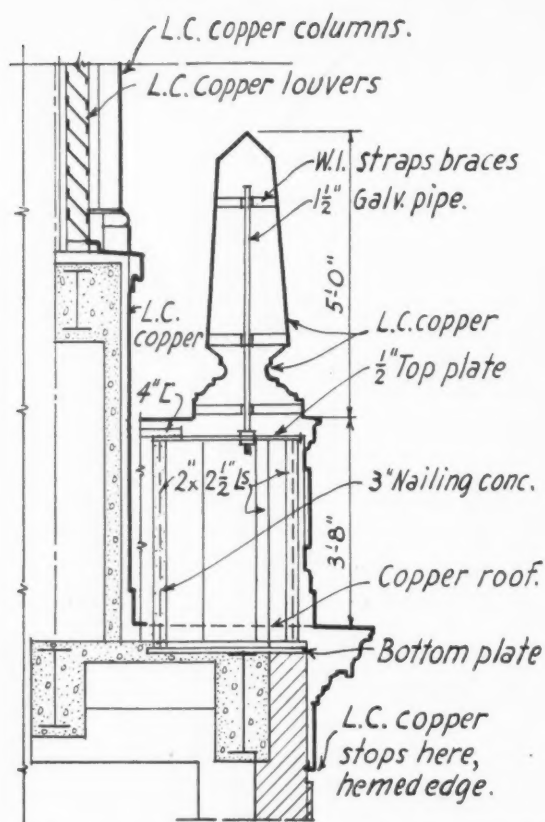
By R. C. Nason

Left—Lead coated copper tower on Forest Hills, L. I., high school. All the tower, down to the deck behind the balustrade, is copper sheathed.

Right—Upper tower roof and finial; also copper sheathed columns of the Bayside, N. Y. grade school. The belfry, see photograph on page following, is sheathed in lead coated copper.



SECTION - ROOF



SECTION AT CORNER OF BALUSTRADE

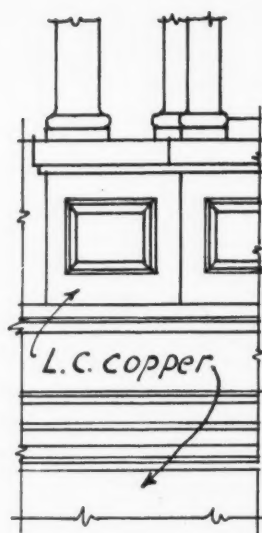
Ornateness increased somewhat on the Bayside Grade School, with its square, louver-sided tower about 50 feet high, measuring from brickwork to the top of the finial. Its sides are 38 ft. This work also has corner pylons of hollow, stamped 20-oz. copper. The belfry roof is rounded, six sided and ends in a simple finial. Ventilation copper louvers on four sides, each 8-ft. wide by 20-ft. high, are a prominent part of design. Four stamped copper urns set-off corners.

The tower from the brick base to the finial is, therefore, sheathed in metal; ornamentation is metal either stamped or formed. The ballustrades surrounding the square base of the tower, for example, seen just above the brickwork, are of hollow, stamped copper. Below the ballustrade is a shallow copper cornice. On completion, the entire sheet metal work received the further protection of three coats of cream-colored paint. The final result is reminiscent of Revolutionary-days American architecture.

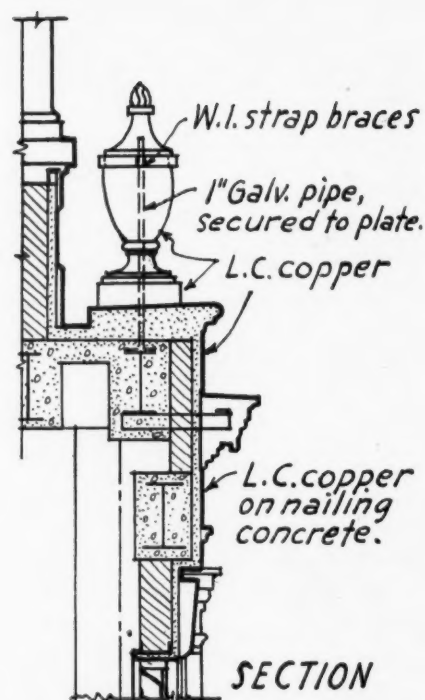
#### Benjamin Franklin Tower

Evidently, as time progressed, the architectural department became still more ornate-minded, for the currently building Benjamin Franklin High School is still more attractive in appearance. The Brooklyn Roofing Corp. in this case applied 30 tons of heavy sheet copper on the tower, as standing seam roofing, flat roofing, flashing, gutters and miscellaneous applications.

All pitched roof areas were treated as standing seam roofing, laid in the usual manner, drained



ELEVATION



SECTION

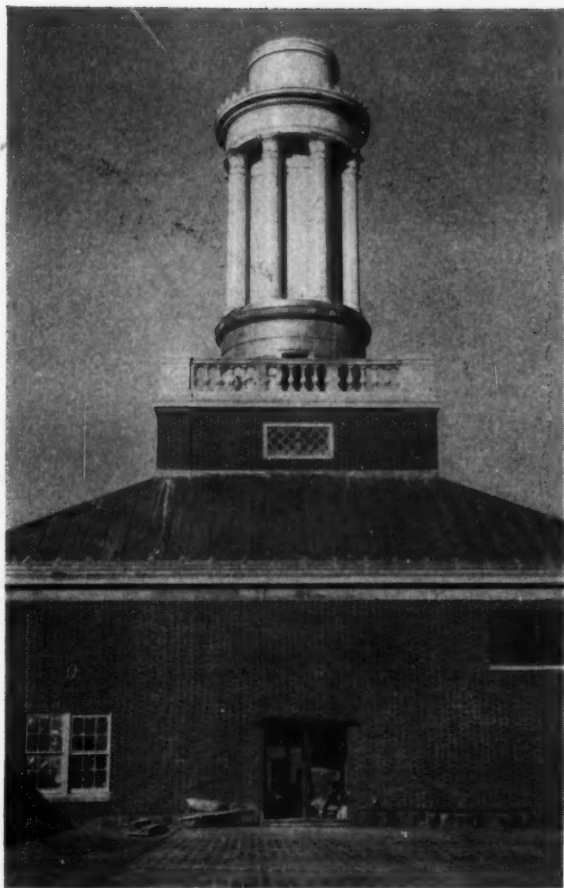
Left—Construction of pylons and balustrade on Bayside school. Above—Copper construction at upper cornice, urns, and belfrey deck. See photograph below.

by box, or lined, copper gutters, 14 in. wide by 8 in. deep. Machine room housing, several ventilation housings and certain other roof surfaces were covered with flat-seam 16-oz. copper of conventional pattern. Though the same contractor also laid some slag and tile roofing, about 250



Lead coated copper tower on Bayside grade school. Details above show construction of ornamentation.

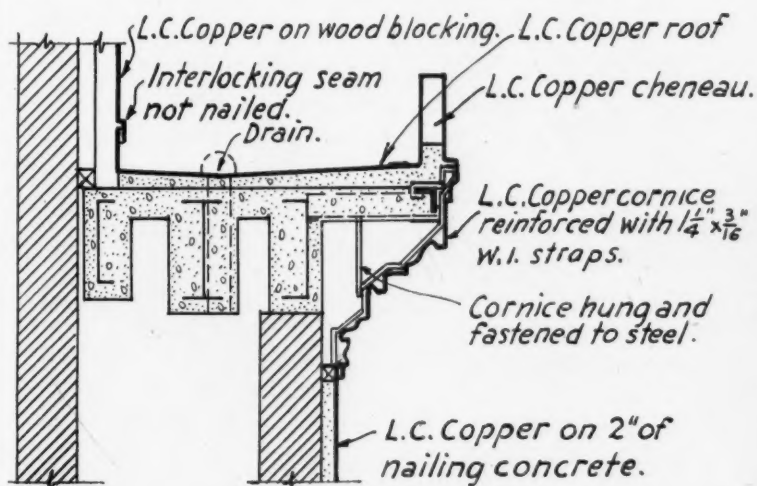




Lead coated copper tower and standing seam bright copper roof on Benjamin Franklin High School. The inner column is the smoke stack.

squares received 16-oz. leadcoated and bright copper covering as indicated.

Flashing of copper was used in abundance as cap, base, drip, step and the other regular varieties of application. Altogether 4,000 linear feet of such flashing were furnished and applied. Other miscellaneous coppered points were venti-



#### DETAIL AT CORNICE OF TOWER

The deck between the rusticated tower base and the balustrade is flat locked and soldered copper. The cornice below the balustrade is also copper.

lation louvers, of which a total of 45 were furnished, 15 solid lead windowhead ornaments, cast by Miller & Doing. These, weighing almost 20 lb. each, were bolted to windowheads.

But, as already stated, the outstanding architectural feature of this structure is the large copper-covered tower, one function of which is concealment of an 8-ft. diam. smoke stack. Thus the sheet metal contractor's work had to be centered about the stack. The main tower base is, like those in previously cited examples, square, yet most of the copper capping and arrangement of ornaments are curving. Specifically, sheet metal work on the tower covers an area 40 ft. high by 64 ft. in circumference.

#### Column Construction and Ornamentation

Eight 25-in.-diam. straight taper columns surround an inner copper covered column about 20 ft. in diameter. The latter factually is capping for the concrete work of the smoke stack. Column material, both inner and exterior columns, is leadcoated copper. The eight columns have ornamented bases and capitols—this stamped ornamentation by Miller & Doing, Brooklyn, N. Y.

Column bases were furnished to the sheet metal contractor as 2 ft. sections, three pieces comprising a set for each column. The roofing contractor soldered the pieces together and flashed the assembly to surrounding flooring as the initial step in the exterior column covering. A total of 45 such base sections were required. (See detail)

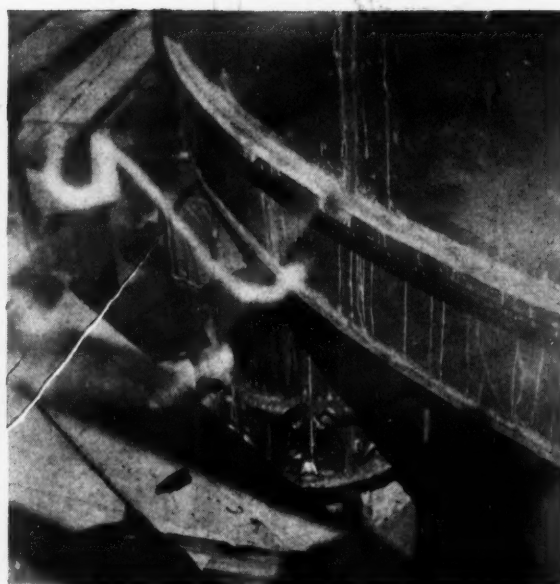
In covering these columns the next step was setting and fastening the capitols by screwing to



The imposing tower pictured above stands at the meeting point of the huge, four-winged main roof. On this school all pitched roofs are standing seam copper; all decks are flat locked and soldered.



Left—Closeup of shell stamped cresting, the main cornice and the dentil course above the columns on Benjamin Franklin school. Right—Closeup of lower moulding in main cornice above columns on same building. Note column capitol under scaffold.



wooden backer plates. Covering intermediate column spaces involved 8-ft. sections of plain copper sheeting with single longitudinal seams placed down the back side. Lock seams and soldering made tight joints. Copper covering of the large, interior surface proceeded in much the same way. For rustication of the base, panelling 2-ft. by 8-ft. was employed. In arrangement alternate panels were flat and rounded, the latter to conform to curvature of the column. Miller & Doing furnished about 50 of these special panels of 16-oz. leadcoated copper.

Special, stamped moulding of approximately

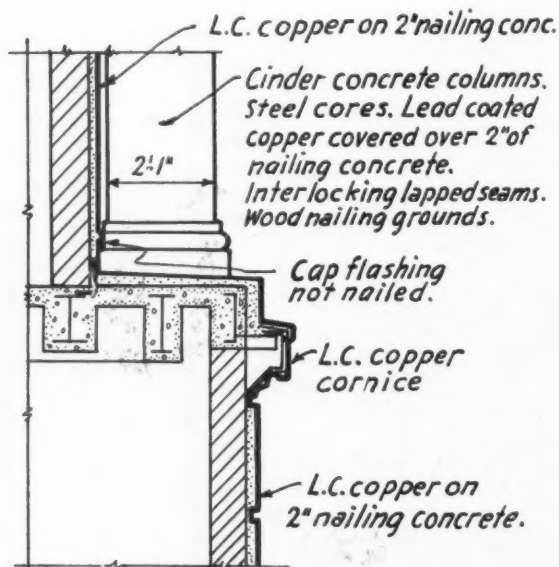
2-in. projection was also furnished by the stamper and was used as embellishment for the large, central area. One moulding near the bottom, another near the top and level with the bottom of the outer-column capitols. The moulding help bring out the beauty of the aforesaid capitols.

The capitols are of Corinthian pattern and 3 ft. high. They flare as they approach their tops, terminating square and 4 ft. by 4 ft. The processor stamped four duplicate pieces of "leaf" design, per head, then soldered them together in the shop. The sheet metal contractor soldered on flat caps to keep out weather and normal city grime on location. The ornamental pattern is that of the city board of Education. Lines were deeply etched and stamped.

#### Capitols, Dentil, Cresting

The dentils just under the cornice is a complete course, fabricated in the Brooklyn Roofing Corp. shop. Individually, they are 3 in. deep by 5 in. high by 2 in. wide and were soldered in place.

The crowning piece of ornamentation is the full course, of shell-design cresting, also furnished by Miller & Doing. Shells were placed 18 in. on centers and are hollow stampings with integral bases. The latter were screwed to wood backer strips, embedded in concrete. The circumference of this cresting course is 54 ft., or about 18 ft. diam., which calls for 45 such ornaments. Shells are 3 in. deep by 14 in. high and surmount the entire work except a flatseam round area 6 ft. high to the top of the stack. Cream-colored paint covers the entire work. Thirty tons of leadcoated and bright copper in 16 oz. and 20 oz. weights were required for this school.



#### SECTION AT LOWER CORNICE

Construction of column base, deck, cornice and rusticated tower base. Note interesting material construction of columns.



Stainless steel bin 8-3 was one of the largest units fabricated—weighing 1400 pounds. The picture shows the bin upside down—in place it is suspended from the ceiling, with the hoppers down. For construction see drawing on next page.

## Tanks, Bins and Hoppers

Tanks are always interesting because of the fabricating problems involved. The larger the tank, the heavier the metal—the more interesting the construction. When there are several dozen tanks in the order; when these tanks reach almost one ton in weight; when stainless steel as well as galvanized iron is used; when especially "tricky" hopper bottoms are included—then the contract becomes worthy of study. Goergen-Mackwirth Co., Inc., Buffalo, N. Y., recently completed just such a contract for the General Mills, Inc., Buffalo cereal mill.

**F**OR storing, processing and handling of grain, flour and finished product cereal at the Buffalo, N. Y., plant of General Mills, Inc., the Goergen-Mackwirth Co., Inc., Buffalo, fabricated and installed a most interesting contract involving 73 tanks and hoppers.

Included in the total of 73 units are tanks of stainless steel and galvanized iron (9 black iron cones and 36 black iron measuring spouts) round tanks and oval tanks, tall, slender tanks and fat, squat tanks; tanks standing on legs, tanks hung from the top, even tanks running on trolleys; tanks without hoppers, tanks with single or double hoppers; tanks of plain, simple construction and tanks of irregular, complicated construc-

tion; tanks with open tops, tanks with charging doors, tanks with bolted covers—ranging in size from small receptacles to units weighing almost one ton.

In general, tanks of the same material—that is of stainless steel, or of galvanized iron—were fabricated to a standard procedure which can be explained by describing a few typical units in the two materials and reproducing critical details in sketches, plans and elevations.

### Stainless Steel Tanks

From the seven types of tanks fabricated in stainless steel two units illustrate the construction



employed and indicate the nicety in layout, machine work, fitting-joining and finishing required.

Unit number 8-3 is a stainless steel bin, 16 gauge, approximately 10 feet 3 inches by 4 feet 6 inches in plan, oval in shape, about 10 feet 6 inches high and was designed for suspension from the ceiling. Goergen-Mackwirth built the bin complete as a unit in the shop; when ready for delivery (see photograph) the bin weighed approximately 1400 pounds.

The 16-gauge stainless sheets were rolled to contour in a heavy hand roll. Two sheets were joined to make the top section, two sheets to make the bottom section and four formed pieces were used in each hopper. Vertical seams in the bin section were staggered as shown in the photograph and all seams were riveted on close centers. Finally, the seams were soldered to obtain dust tightness.

Because of the size of this bin two special stiffening frames of 2x2x1/4-inch black iron angles were constructed and riveted to the two sides as shown in the photograph and sketch. The frames were completely assembled by welding before application to the bin.

Four pieces of metal, irregular in contour and

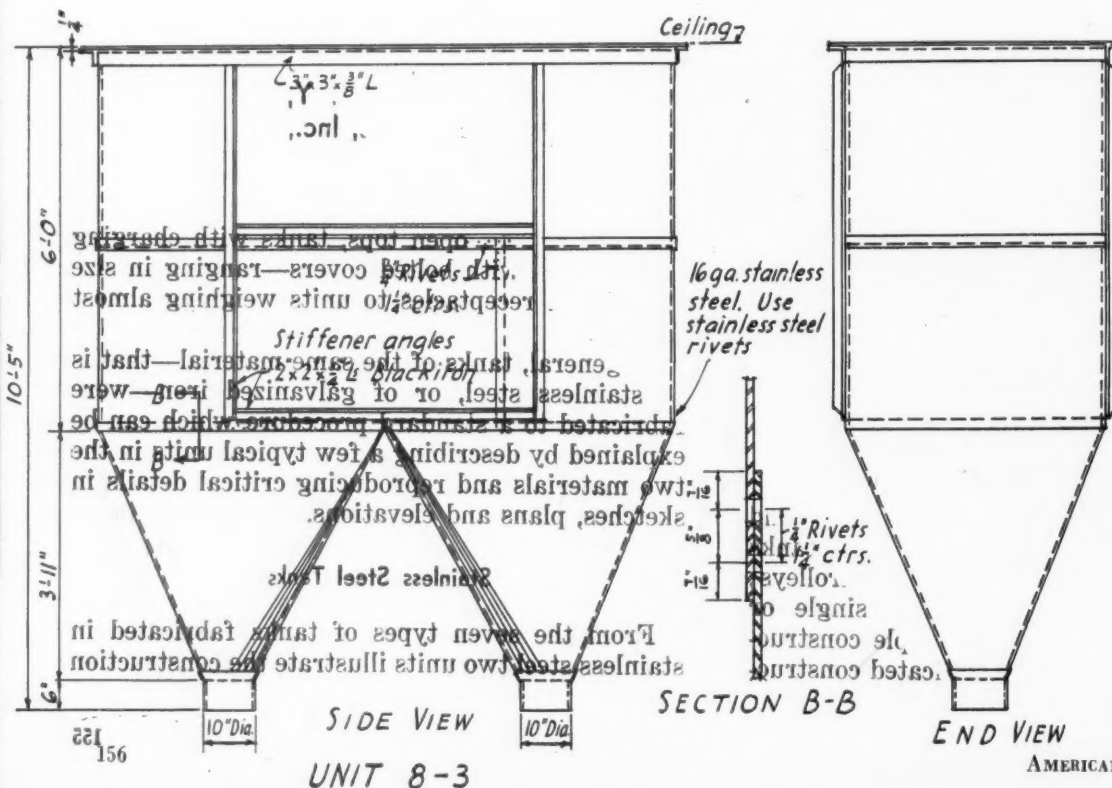
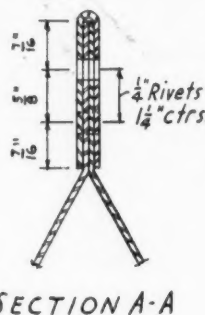
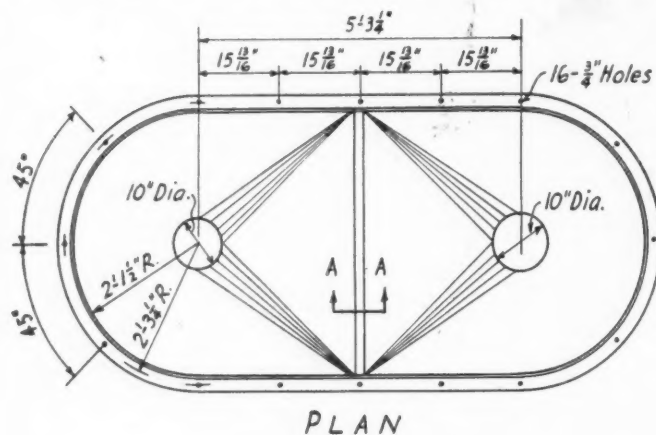
cut to shape from specially prepared patterns were riveted and soldered together to form each hopper. An idea of the shape and dimensions of the pieces can be obtained from the photograph. The top (large end) of the hoppers was flanged to slip over the bottom edge of the bin. Then the two hoppers were slipped in place and riveted through the lapped flanges and the meeting line of the two hoppers was riveted. The preformed collars were then put in place, riveted and soldered.

The supporting frame is a rolled 3x3x3/8-inch angle (rolled for Goergen-Mackwirth) and riveted (double row) to the top edge of the bin.

#### Charging Bin on Legs

Stainless steel bin number 6-1 is typical of the smaller units in 16 gauge or lighter material. Bin 6-1 stands on 6 1/4-pound channel legs and, completed, is almost 11 feet high and weighs approximately 600 pounds. Goergen-Mackwirth fabricated bin 6-1 and others of this type complete in the shop and delivered the bin ready to have the legs bolted on.

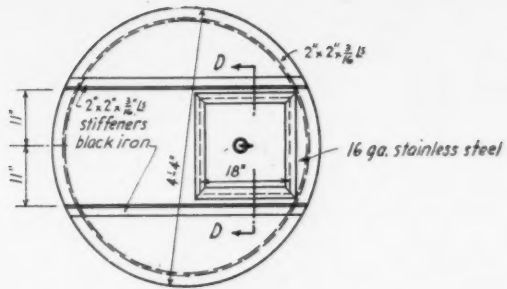
The circular bin proper was rolled from one



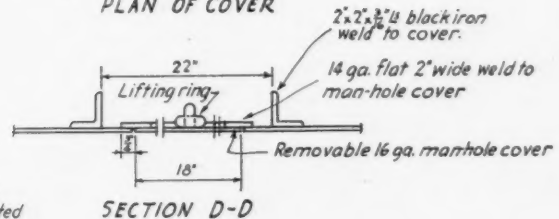
Plan, elevation and construction details of the 8-3 stainless steel bin. Four sheets; two sections—constitute the upper bin. Several sheet pieces make up each hopper. Seams are riveted and soldered for dust tightness. Because of the large size, the special stiffening frame shown was added.



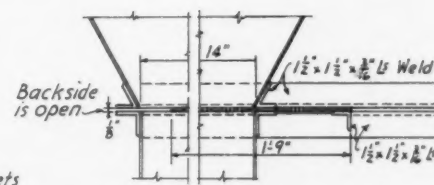
PLAN OF BIN & HOPPER



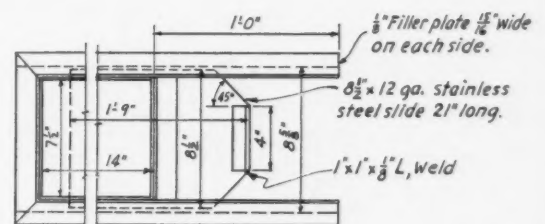
PLAN OF COVER



SECTION D-D

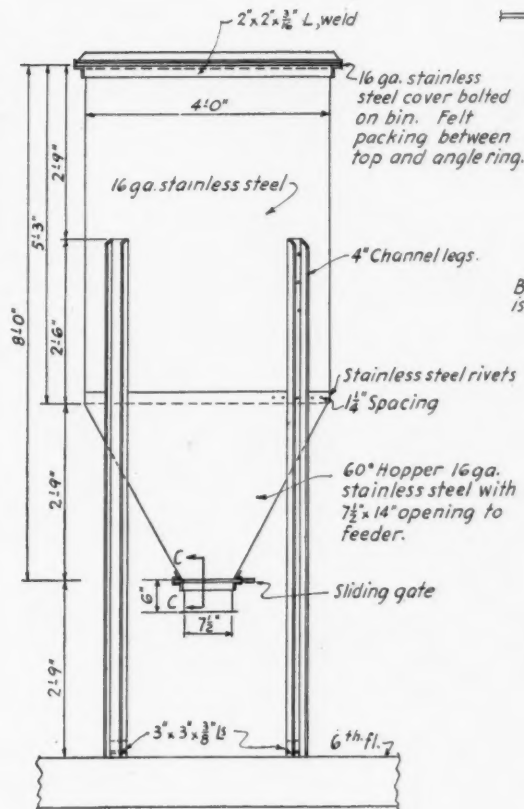


ELEV-SECTION C-C



PLAN - SECTION C-C

This smaller, stainless steel bin stands on legs and was fabricated from one top section sheet and one bottom sheet, with riveted seams. The details show the sliding gate, built up of angles and spacers, and the bolted on cover with the charging door of stainless steel and black angles.



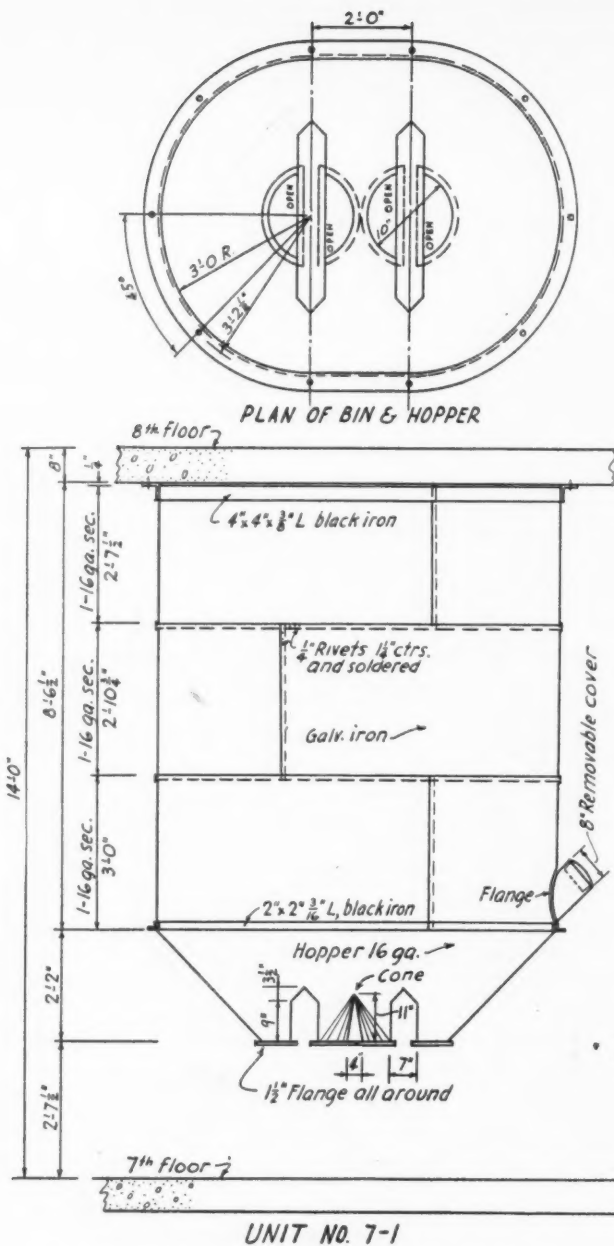
UNIT 6-1

sheet with the seam lapped, riveted and soldered. The 60-degree circular hopper was rolled from sheets using special patterns to get the rectangular bottom opening; the lap joints were riveted and soldered. The flanged edge of the hopper was slipped over the lower edge of the bin and the seam riveted on close centers and soldered. The channel legs were bolted in place on the bin as shown in the drawing in the field. Four-inch pieces of 3x3x3/8-inch angle were riveted to the bottom of the channels as feet to the legs.

The two interesting details of this bin are the top with its manhole cover and the sliding gate at the bottom of the hopper. Details of these two parts are shown in sketches. Goergen-Mackwirth cut the circular cover on the power throatless shears. The top edge of the bin is reinforced with a circular 2x2x3/16-inch angle riveted around the bin edge. The horizontal leg of the angle forms a ring to which the 16-gauge cover is bolted through the cover angles with 1/4 by 5/8-inch bolts. A felt packing makes the top airtight.

To charge the bin, a manhole as shown in the cover detail was constructed by fitting a slightly smaller 16-gauge plate into the 18 by 18-inch hole in the cover. This plate maintains position in the hole by having a 2-inch wide flat stainless steel, frame, 14 gauge, welded to the manhole. The cover is stiffened by welding two 2x2x3/16-inch angles across the cover like tracks. As completed, the cover is airtight and the bin is charged by opening the 18 by 18-inch manhole.

The slide gate on the hopper is constructed by using a flat piece of 12-gauge stainless steel as the gate with a piece of 1x1x1/8-inch angle riveted across the front edge to form a pull. The 12-gauge plate slides between two 11 1/2 by 11 1/2 by 3/16 angles which are held apart by a 1/8-inch filler strip. Note on the detailed sketch that the upper three angles (one for each side) are 60 degrees to take the 60-degree slope of the hopper. The angles are riveted to the hopper above and to the discharge collar below and to each other through the filler strips.



This galvanized iron bin, 11 feet high, 8 feet in diameter and weighing nearly 1,000 pounds, has a really "tricky" double hopper bottom which required special patterns and fabrication from several pieces.

#### Galvanized Iron Bins

Three bins constructed of galvanized iron illustrate the variety in types, size, usage of the galvanized units.

Bin designated as Number 7-1, almost 11 feet high by 8 feet in diameter, with a double hopper bottom weighed approximately 1,000 pounds complete. This unit, despite its size and weight, was also fabricated as a unit in the shop and delivered ready to hang.

The bin proper, with circular ends as shown on the sketch, was fabricated from three sheets to a section. Vertical seams were lapped and riveted. Three, three sheet sections make the bin proper.

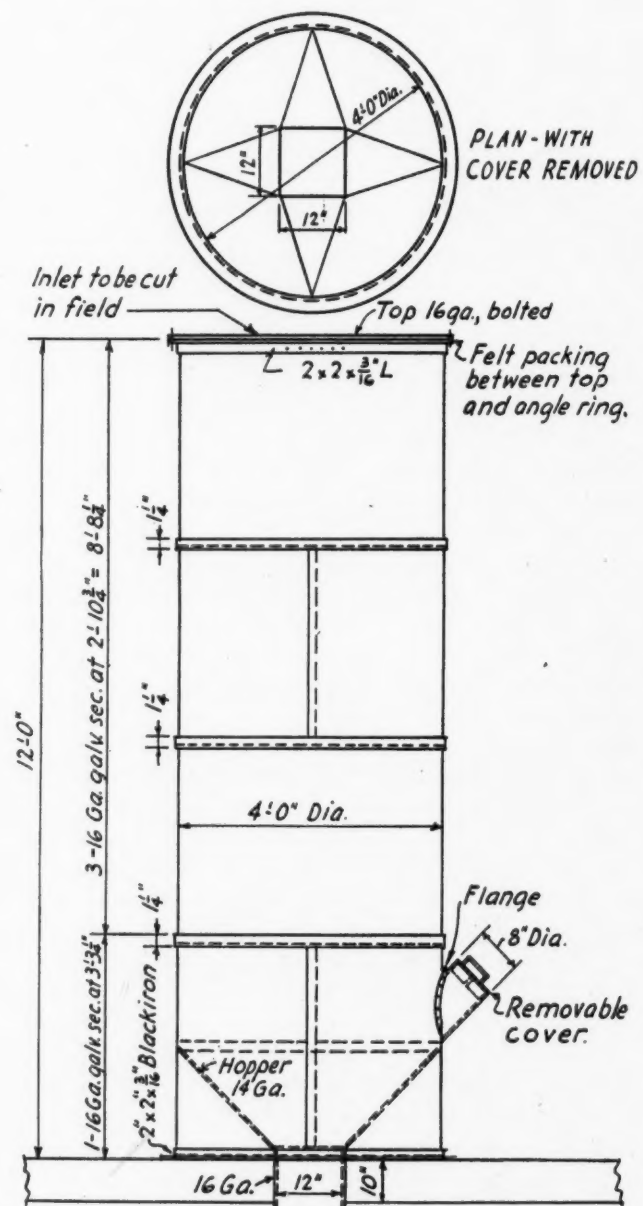
Right—Tall, slender, galvanized iron bin 8-10 is relatively simple except for the enclosed hopper bottom. One-sheet sections are lapped, riveted and soldered. Note that intermediate angle stiffening is not used.

Horizontal seams were made by lapping and riveting. To assemble, Goergen-Mackwirth first put three sheets together to form a section; then put sections together to make the bin. The top and bottom stiffening angles, of sizes shown, are riveted to the bin. The bin is suspended through the top angle ring.

The hopper bottom has four half-circle openings as shown in the plan, each pair of openings divided by a let-in rectangular divider (see plan) and the two central openings separated by a sloping cone. This hopper required special patterns and fabrication from several irregular shaped pieces. All seams were riveted and soldered. The lower edges of all four openings carry a semi-circular flat flange.

Typical of several slender, cylindrical tanks is unit 8-10 shown in plan and elevation, having a closed top, hopper bottom and constructed of 16-gauge galvanized iron. Two sheets were used to make each section with vertical seams opposing. Sections were first constructed with lapped, riveted and soldered seams. Then sections were

(Continued on page 214)





# Waste Material Conveying Pipe Sizes

IN answer to requests, we publish again the table of branch pipe sizes recommended for waste product removal from standard wood working, grinding, and buffing machines. This table is re-

printed by permission of the owners of Standard Practice In Sheet Metal Work. The sizes, velocities and data are used almost universally by the manufacturers of the machines.

## PIPE SIZES USED IN EXHAUST FAN WORK

Branch pipes that exceed 25 feet in length require an additional 10 per cent increase in area capacity for each 20 feet so added.

HEAVY WOOD WORKING MACHINES OF STANDARD SPEED.		
For Buzz, Pony or Diagonal Planers, Moulders, Jointers, Matchers and Stickers, Use one pipe for each set of knives.		
Length of Knives in inches	Diameter of Pipe in inches Upper cylinder	Diameter of Pipe in inches Lower cylinder
5	4	4
10	5	5
14	6	5
24	7	6
30	7 to 8	7 to 8
36	9 to 10	9 to 10
For High speed Machines, provide pipes with 50 per cent greater area. Timber Planers require 25 per cent larger pipe than ordinary planers. Typical sizes are		
Tenoning Single Head	5 inches	
Tenoning Double Head	7 inches	
Tenoning Double End and Head	10 inches	
Shaper Single Head	4½ inches	
Shaper Double Head	6 inches	
Shaper Double Head Heavy Duty	8 inches	
Hog Planer up to 12-in. wide	8 inches	
Hog Planer over 12-in. wide	12 inches	
Tongue and Groover	5 inches	
Blind Rail Router	5 inches	
Panel Raiser each Head	5 inches	

SAW AND SANDER PIPE CONNECTIONS		
Kind of Machine	Size of Machine	Diameter of Pipe in inches
Circular Saw	12-in. Dia.	4
Circular Saw	12 to 24	5
Circular Saw	24 to 40	6
Rip and Resaw	Up to 14-in. Dia.	4
Rip and Resaw	14 to 18	4½
Rip and Resaw	18 to 24	5
Rip and Resaw	42 to 60	8
Band Saw	Up to 1½-in. wide	4
Band Saw	1½ to 3-in. wide	5
Band Saw	3 to 4-in. wide	6
Band Saw	4 to 6-in. wide	7 to 8
Swing Saw		4 to 6
Miter Saw		4
Gang Saw	as per size	5 to 9
Jig Saw		4
Drum Sanders	24-in. long	4
Drum Sanders	30-in. long	5
Drum Sanders	36-in. long	6
Drum Sanders	48-in. long	8
Drum Sanders	over 48-in.	10 to 12
Disc Sanders	24-in. Dia.	5
Disc Sanders	24 to 36	6
Disc Sanders	36 to 48	7
Belt Sanders	up to 6-in. wide	4½
Belt Sanders	6 to 10	5
Belt Sanders	12 to 14	6 to 8
Arm Sanders		4
Floor Sweep	up	6
Floor Sweep	down	6

PIPE SIZES FOR GRINDING WHEELS		
Size of wheel in inches	Max grinding Surface	Diameter of pipe
6X1-in thick	19 square inches	3 inches
7 to 9X1½	43 square inches	3½ inches
10 to 16X2	101 square inches	4 inches
17 to 19X3	180 square inches	4½ inches
20 to 24X4	302 square inches	5 inches
25 to 30X5	472 square inches	6 inches

PIPE SIZES FOR BUFFING AND POLISHING WITH RAG WHEELS		
Size of wheel	Grinding Surface	Diameter of pipe
6X1 inch thick	19 square inches	3½ inches
7 to 12X1½	57 square inches	4 inches
13 to 16X2	101 square inches	4½ inches
17 to 20X3	189 square inches	5 inches
21 to 24X4	302 square inches	5 inches
25 to 30X5	472 square inches	6 inches

VELOCITY AND PRESSURE FOR CONVEYING MATERIALS		
Approx. duct velocity 70° air Feet per min.	Velocity pressure in duct inches water gauge	Class of work or materials handled
2000 to 2500	0.39	Gas, Fumes and very light materials.
3000	0.58	Cotton, wool and similar materials.
3500	0.76	Shoe machinery, saw dust, light polishing and buffing wheels.
4000	1.00	Ordinary wood working exhaust systems, heavy polishing, buffing and grinding.
5000	1.55	Heavy duty wood working or wet materials.
6000	2.25	Sand, grain, coal, lead dust, pulp chips etc



# Range Hood and Exhaust System in a Post Mess Hall

By Lawrence E. Gichner  
Gichner Inc., Washington, D. C.

**QUESTION:** What big difference is there between the preparations of World War I and II?

**ANSWER:** One important point is that this time we are building barracks, camps and forts for our armed forces on a basis of permanency.

**FACTS:** Wherever possible, brick, stone, plaster and steel are being used in lieu of wood. Let us examine one small factor in the picture as a whole—range hoods. Instead of inexpensive, light gauge, black iron—heavy gauge steel is being used. Instead of relying on gravity exhaust, power driven blowers are being installed. Instead of a haphazard design, scientific layouts are being constructed.

A typical example is shown in the accompanying drawings indicating practicability and trim appearance were considered. Not only does the fan pull heat from under the hood, but also from grilles on hood face. Closely placed electric bulbs give ample illumination. A wide grease gutter readily catches condensation and keeps unsanitary globules from plopping into food and onto clothing.

Damper controls facilitate regulation. The polished stainless ceiling makes for quick, easy cleaning and the stainless steel trim on the front adds to the hood's attractiveness. Heavy angle and "T" iron structural members give rigidity and permanence.

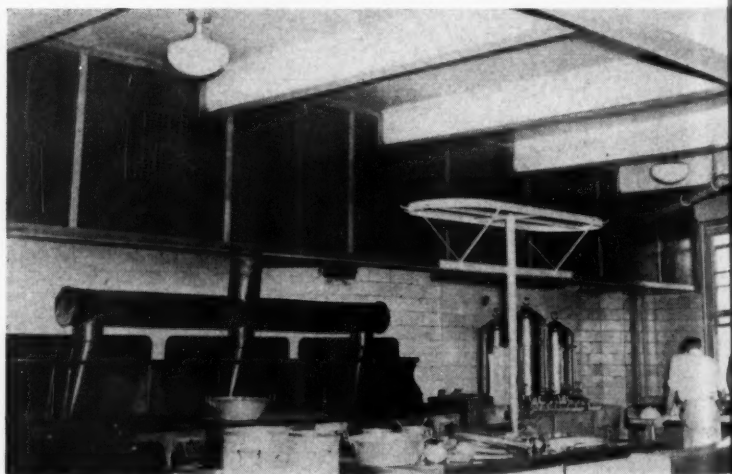
A small contribution that adds to the general beauty of the canopy are the specially made solid

headed stainless steel bolts. Had the regular slotted bolts been used, it is believed they would have detracted from the general beauty.

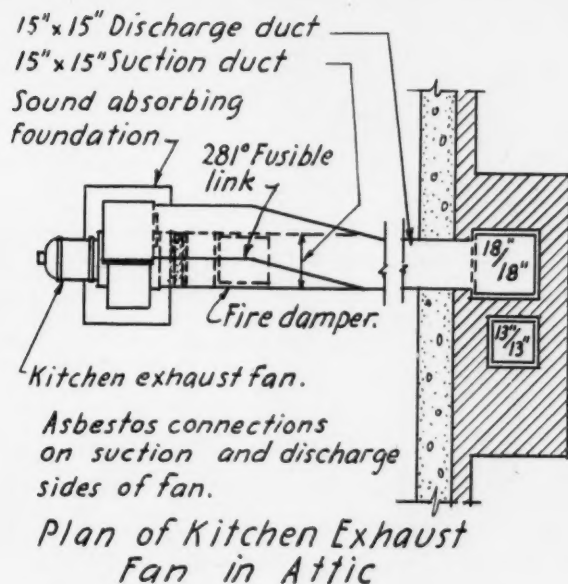
This hood was curved at one end to clear a window and allow no obstruction of light. It was cut away and went around ceiling beams. (See illustration.)

The large galvanized iron duct inside of the canopy empties into a chimney. The duct connects to the underside of the hood proper with six 10 inch round stainless steel collars. In the face of the hood there are two 12 by 18 inch grilles. A heavy stainless steel slide damper on each of the six 10 inch round collars is constructed to move very easily and with a few simple pushes or pulls the whole system is quickly balanced.

The original design placed the fan and motor

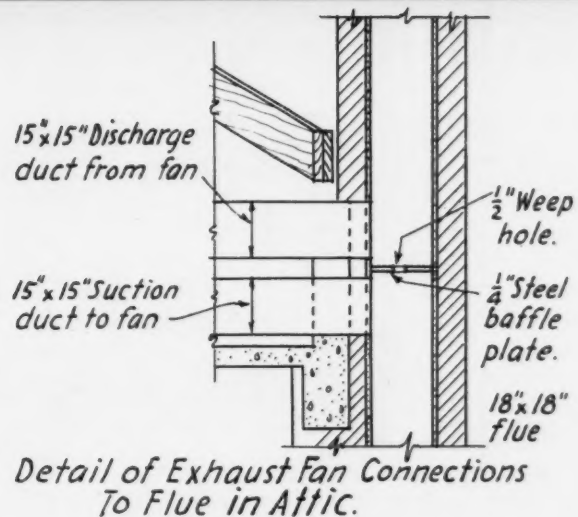


Two photographs show under side and front of the black iron—stainless steel trimmed, range hood. Note grilled face intakes and port hole exhausts with sliding dampers. See details facing for construction.



inside of the hood exhausting directly into the chimney flue. In this awkward position cleaning and oiling would have been difficult. Further, the heat rising from the stoves underneath would not have helped the life of the motor. As a result of our suggestion, and the accompanying drawing, the blower was placed in the attic.

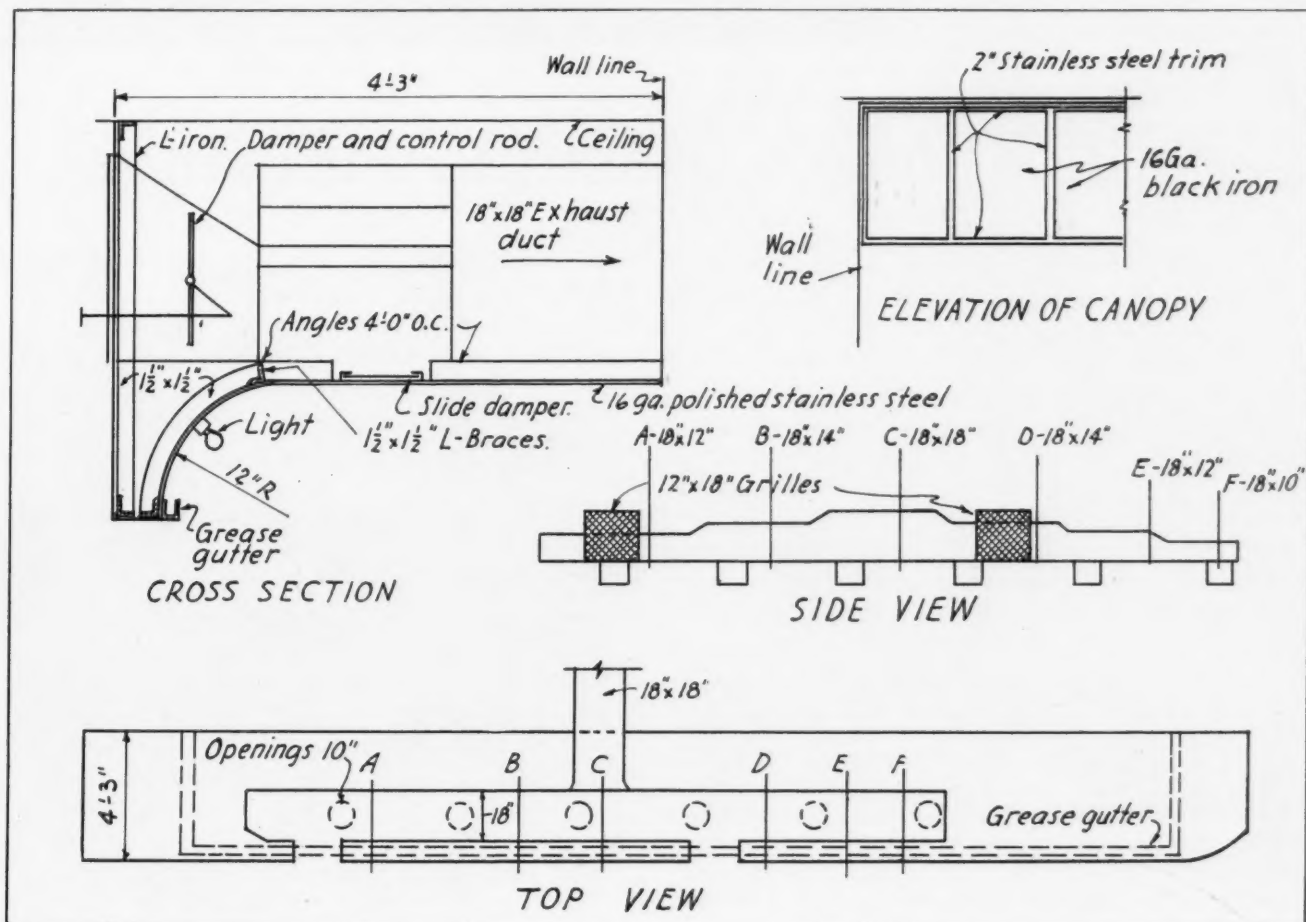
This change utilized an unoccupied area, and by putting the fan and motor on the attic floor made maintenance an easy and ready performance. A 1/4-inch steel baffle plate with 1/2-inch weep hole for rain water was placed in the flue. The suction duct runs from under the baffle to the fan. The discharge duct extends from the fan to above the baffle. To minimize noise, the fan



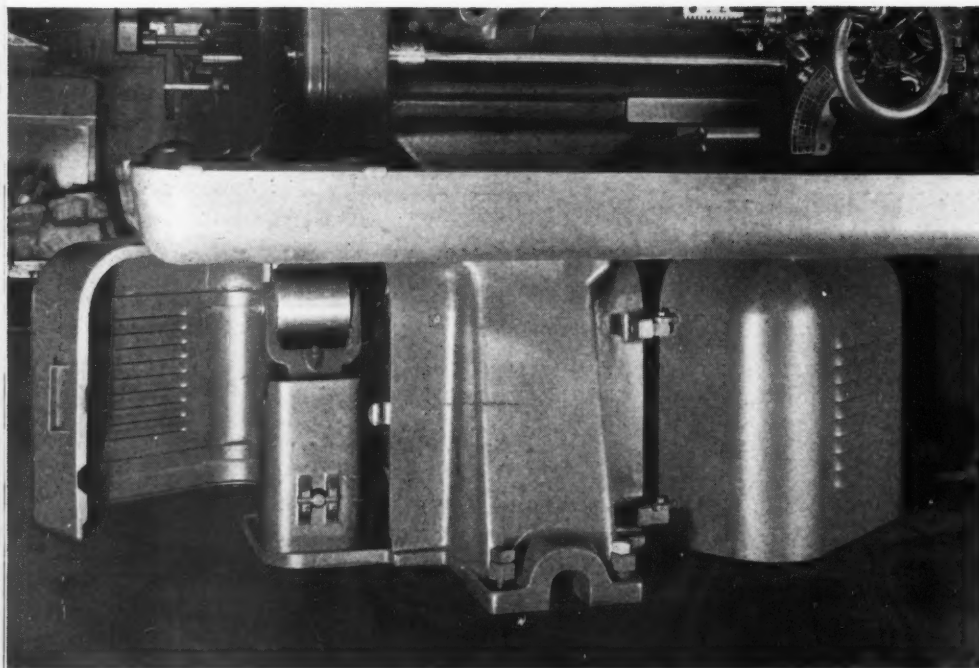
Above, left—Fan and motor located in attic with the flue divided for intake and exhaust by a plate (at right). This places fan and motor remote from hood and grease. Below are plans and details of the hood and its features.

is placed on a 2-inch cork, sound-absorbing foundation. Asbestos connections are installed on both the suction and discharge sides of the fan. A heavy fire damper is placed in the suction duct and held open by a 281 degree fusible link.

The trim on the front elevation of the canopy was made by laminating 26 gauge stainless steel over 2-inch wide band iron. The front panels are 16 gauge black iron.







Above—The housings described in the article enclose gears on the machine as shown in this closeup of a machine base. The welded reinforcing bars and the welded-in corners; also welded-on hinge brackets and catches show plainly. Note also inside and outside appearance of the louvres.



Below—Finished shallow and deep housings after forming, welding and grinding ready for final inspection and delivery—without paint—to the machine manufacturer. Compare this outside view of the welded-in corner with the photograph above which shows the inside. Overly-Hautz welding department in background.

## Fabrication of Machine Housings

FOR the manufacturer of heavy-duty, metal working machines, Overly-Hautz Company in Cleveland has for many months been fabricating the machine covers shown completed, ready for finishing and in process of fabrication, in the photographs.

These heavy-gauge housings, simple as they seem completed, require practically every shop operation used in modern metal manufacturing.

In general, two types of covers are in production. The first is fairly shallow; the second is a deep cover with louvred face and deep sides and requires the following steps in fabrication—shearing to size; provisioning for flanges, cut-outs, notches, flanged top opening; die cutting of the multi-louvred face; mitering for the welded corners; press forming of the top edge of face and sides; jiggling and welding of miters and fittings; grinding of welds; welding on hinge brackets and catch; welding on bar reinforcement; and finish-

ing in some cases.

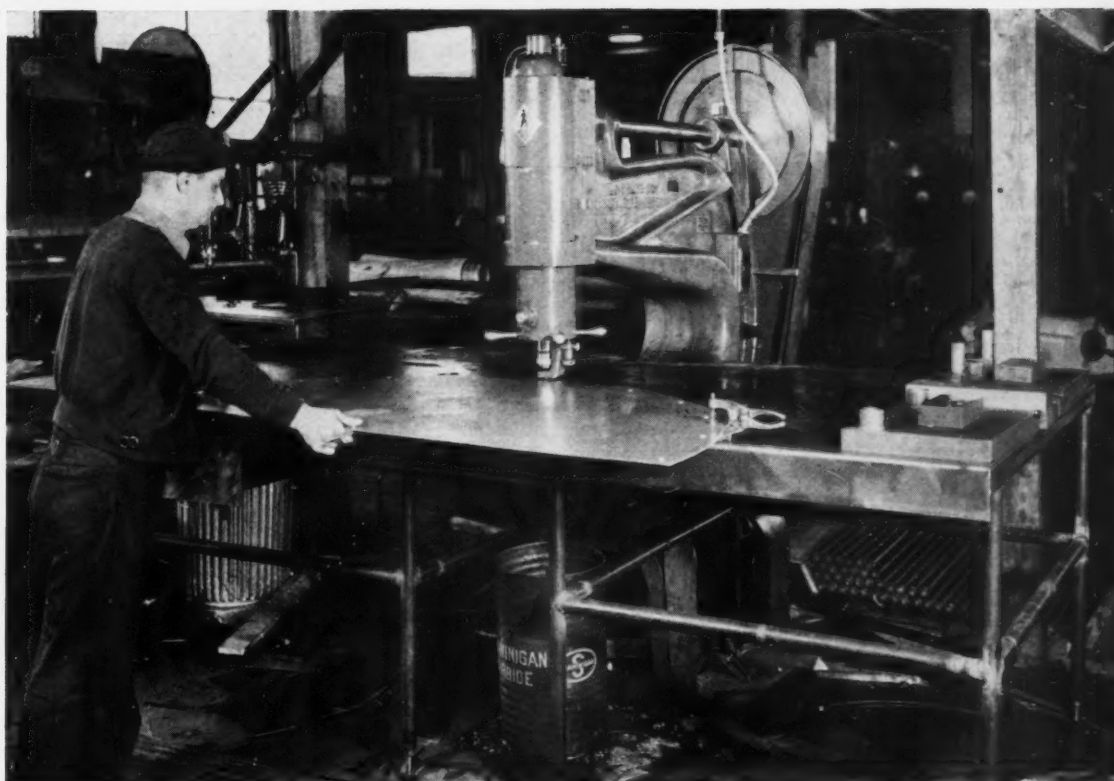
Overly-Hautz is completely equipped and staffed to produce these covers through all operations, in quantity. The photographs show the excellent equipment set up and the covers in various, typical operations.

### Shearing—Notching—Pressing

Flat sheets of 8-gauge furniture steel are first received from stock piles at the power shears where the stock sheets are shear blanked to size in gage set-ups developed for this particular item. From the shearing operation, the blanks are then sent to smaller power shears where the cutout for the round, mitered corner is made to take an insert later welded in. In Overly-Hautz all shears are grouped in one department so that travel of pieces from stand to stand is minimized.

The notches in the turned-in edge are next cut

The heavy duty nibbler with 36-inch throat and  $\frac{3}{8}$ -inch stock capacity finds many uses in the Overly-Hautz shop. Here the nibbler is tracing a pattern clamped on the sheet. The special all-welded work table was built in the shop and accommodates very large pieces. Note some of the scrap with different contours.



so that the door when closed will clear certain projections on the machine base. While the sheet is still in the flat, the multi-louvres in the face must be cut and formed. This is a die cutting and press operation for which Overly-Hautz has set up a single die which cuts one slot and forms the rounded louvre. Nine passes through the setup completes the louvre arrangement.

With the louvres cut one more operation in the flat sheet must be made—the turning of the edges. A setup at a power brake turns the bottom

edge in; the side edges in; the flange at the top outward.

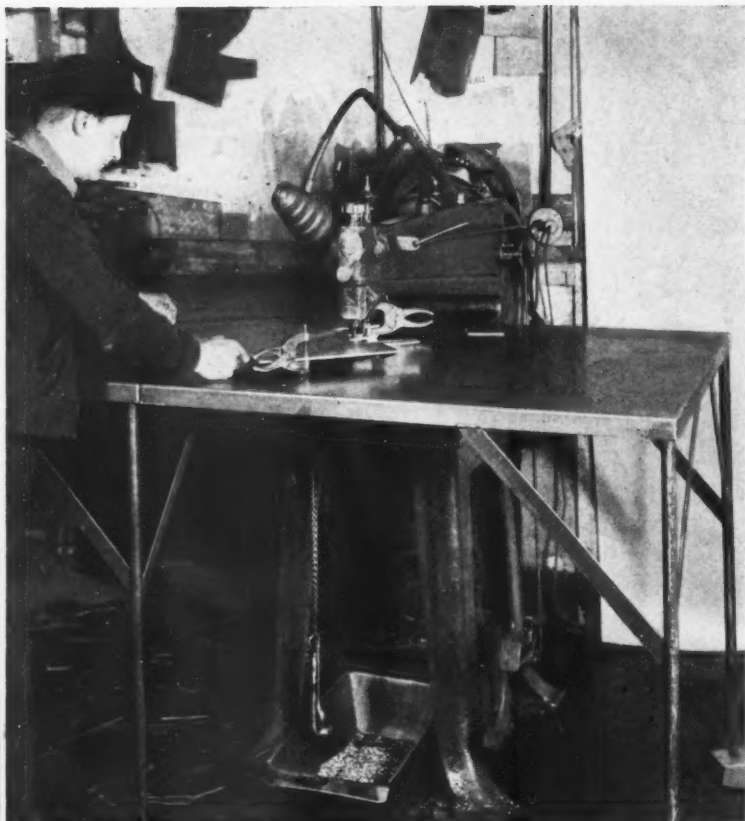
The last machine operation ahead of the welders is the forming of the rounded side and front top edges and the rounded, vertical corners (see photographs). With the corner cut out and the sheet still in the flat, the provisioned sheet is placed in a special die setup in the power forming press where in one operation the round edge is made in the front face and on both sides. Using the same pair of dies to keep the radius the same,

Below—The segmented band filer does in a few minutes the same amount of filing formerly requiring several mechanics working by hand. The housing louvres are being filed smooth.

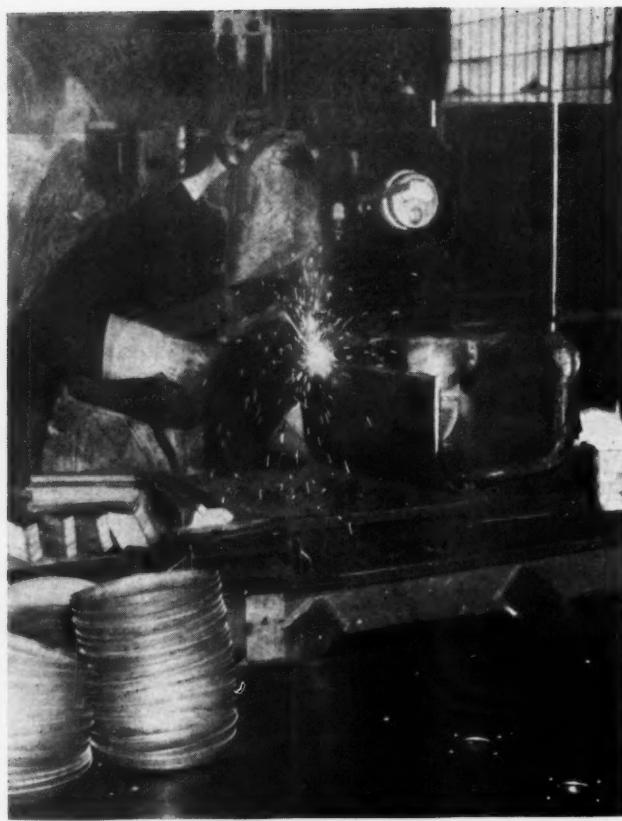


Above—Presses are grouped in one department so that press operations can be passed from machine to machine with a minimum of travel. Note stationary and portable material tables and special work tables.





This small, high-speed nibbler is used mainly for irregular notching to template, but also produces duplicates from small templates. Note hold-downs for template and blank.



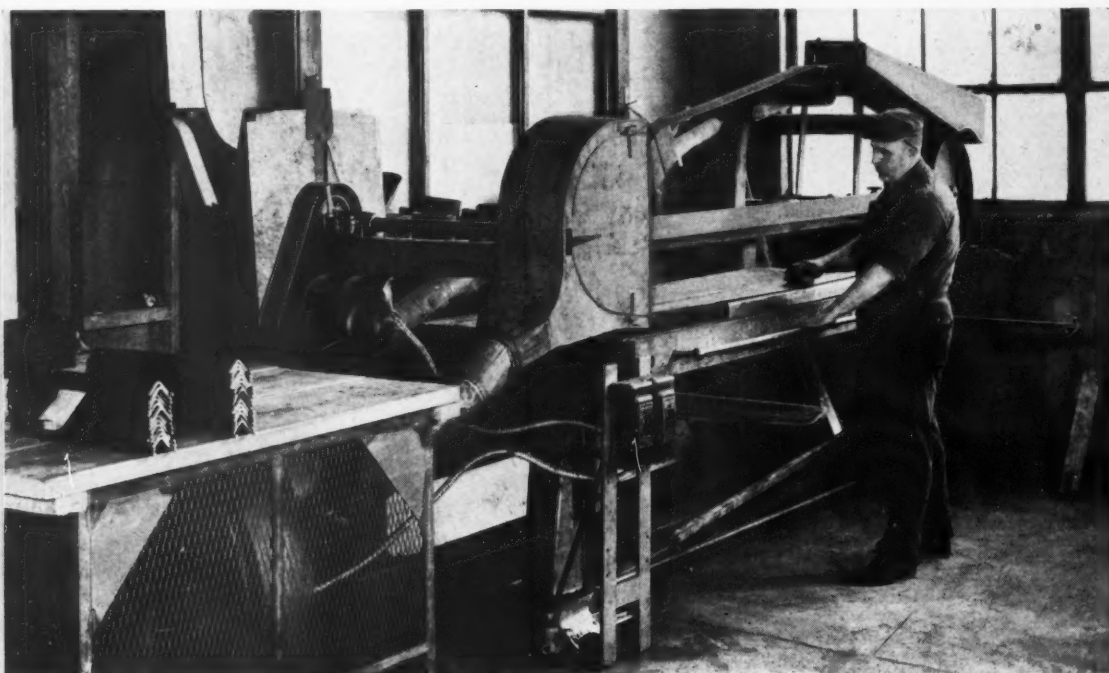
The welder here is finishing the corner insert weld at the edge of a housing. Overly-Hautz has several stands of electric arc welders—also grouped into one department.

the two vertical front corners are formed and the cover is ready for the welders.

Because Overly-Hautz does much welding—in fact depends on welding for a great many time-saving operations in manufacture—a complete setup of electric arc, spot, torch welding is partitioned off in one end of the shop. There are seven welding operations made on each cover. First of all, the two stiffening bars are welded into the inside (see photographs)—the two bars being formed to contour previously in the ma-

chine shop where bar stock is cut, formed, machined, etc. The bars are welded to the cover sheet by laying a weld along both top and bottom edge with the electric arc.

Then the reinforced cover is placed in a trueing-up table fixture which holds the cover rigidly in exact formation while the two previously pressed corner insets are welded in place. These insets are welded on the outside so that when ground there will be no air holes in the weld and the weld will be invisible. The two hinge brackets



This large sander is not used in fabricating the housings, but is shown to illustrate the completeness of Overly-Hautz equipment. The angles on a special fixture—after shearing—are smoothed under the sanding belt by applying pressure to a top belt block.



Tables for arc welders are in the right, background. In center are the flexible shaft grinders and polishers (see closeup below). Note that these grinders are pneumatic with hoses taken off a centralized air piping stand. Housings in rear have not been ground or polished—housings in foreground have been ground and some polished.



are then welded on and the catch-handle welded in place—the cover is removed from the fixture and taken to the grinding department.

High speed, flexible shaft, air grinders are used to take the welds down to the surface metal; welds of the hinges and catch are touched up and the covers are ready for delivery to the machine manufacturer except where Overly-Hautz applies the paint finish. A complete spray finish department with drying ovens is housed in a separate room with experienced finishers who can and do regularly finish to almost any color in a variety of material finishes—paint, lacquer, enamel; air dry or oven baked.

Overly-Hautz began several years ago when Mr. Overly and Mr. Hautz visualized a tremendous market for sheet products manufactured in quantity for an ever growing number of sheet metal articles. The first shop was modest in size and equipment, but the work performed was plainly indicative of a complete ability to fabricate simple or complicated products to close tolerances at marketable prices. Year by year the plant has been expanded and earnings ploughed back in equipment so that, today, this Cleveland shop is one of the largest, best equipped and staffed organizations in the Middle West.



Left—Closeup of pneumatic, flexible disc abrasive wheel putting final touches to a housing inset corner weld. The housing is on a block to permit the operator to work from all sides. Above—Spray booth and part of Overly-Hautz baking oven department where products can be painted, enameled, lacquered.

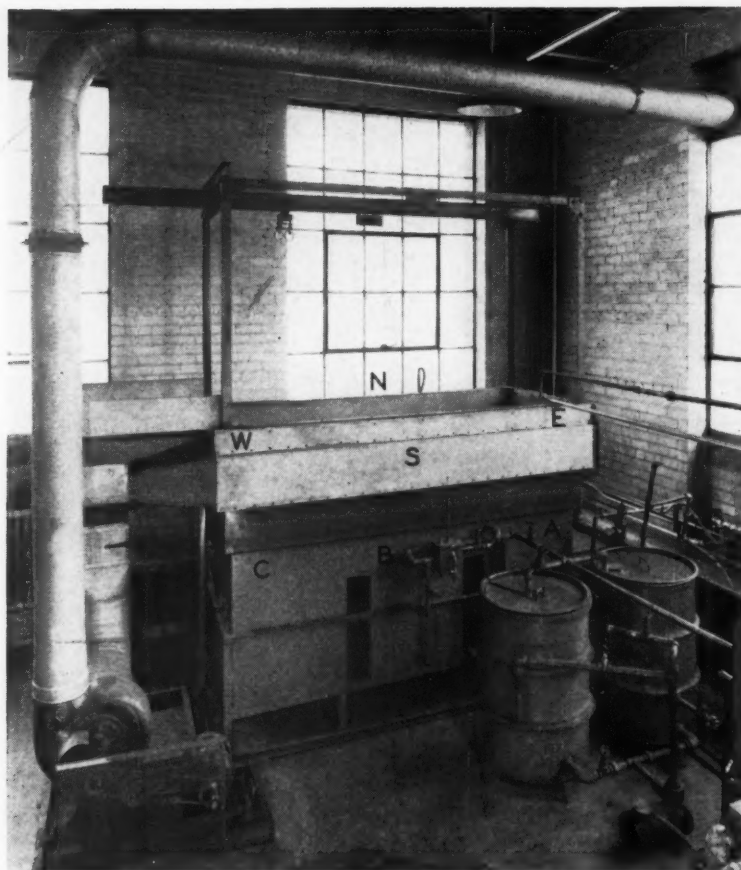


Fig. 1—Side view of the degreaser with platform removed. A, boiling chamber; B, rinsing chamber; C, vapor chamber; N, north side; E, east end; S, south side; W, west end.

# Ventilation of a Trichlorethylene Degreaser\*

By William N. Witheridge and Herbert T. Walworth

Bureau of Industrial Hygiene, Detroit Department of Health, Detroit

**T**RICHLORETHYLENE is in wide use at the present time for the removal of oil and grease from a great variety of metal parts. Degreasing is usually accomplished by immersion, vapor or spray methods and each method may be applied separately or in combination with the others, either by hand or with automatic equipment.

In the process of degreasing a certain amount of vapor escapes to the atmosphere around the degreaser. The resulting trichlorethylene concentrations in the air depend on many factors including the design and size of degreaser, operating temperatures, quantity of work, degreasing technic, size of room in which the work is done, air currents, and amount of ventilation. High concentrations of trichlorethylene in workroom atmospheres may exist if no attempt is made to supply mechanical ventilation to the workroom or the degreasing equipment. General ventilation of the entire room may be impractical if the room is

large. If exhaust ventilation is applied locally at the degreaser it must be employed carefully to prevent excessive amounts of solvent from being carried away with the exhausted air.

Because of limited information on the design of local ventilation for open tank degreasers, a study was conducted with four types of local exhaust systems on a degreasing tank 20 square feet in area. The study was undertaken to determine for these exhaust systems the effect of ventilation rate, air velocity at the face of exhaust openings and location of exhaust openings on trichlorethylene exposure and loss.

Figs. 1 and 2 show the arrangement of degreaser and ventilating apparatus in the experimental room. The overall room dimensions were 18 feet 9 inches wide, 38 feet 7 inches long and 16 feet 4 inches high, making a volume of approximately 12,000 cubic feet. The room was in the northeast corner of the building with its long dimension on the east side. The degreaser was located in the northeast corner of the room with its boiling chamber A toward the east and the vapor chamber C toward the west (Fig. 1).

\*Reprinted by permission from the *Journal of Industrial Hygiene and Toxicology*, May, 1940.



Hereafter the sides and ends of the tank will be known as "north, east, south and west."

The degreaser used in this study was an open type, three-dip or three-stage machine 72 inches high, 88 inches long and 33 inches wide, surrounded by a 28 inch movable platform. The normal distance from the top edge of the tank to the vapor level was 19 inches. Under operating conditions the solvent capacity of the boiling and rinsing chambers was 90 gallons each or a total of 180 gallons.

The four types of local exhaust ventilation applied to this tank are illustrated in Figs. 1 to 5. Figs. 1 and 2 show the "vertical slot" type, Fig. 3, the "horizontal slot" type and Fig. 4 the "elongated hole" type. The "round hole" type is indicated diagrammatically in Fig. 5, which shows the arrangement of the four systems in relation to the side of the degreasing tank.

In spite of instructions to operators concerning correct degreasing technic, cleaned parts often entrain hot solvent upon removal, which contributes to the solvent exposure. For this reason, the ventilating system incorporated an exhausted table or grille at the "take-out" end of the tank where cleaned parts could be placed for evaporation and removal of entrained solvent (Figs. 1, 2 and 3).

The centrifugal fan used on this study had a 12 inch diameter impeller connected by a V-belt drive to a 1 h.p. motor on an adjustable base. The motor pulley was an adjustable type giving a wide range of fan speeds. The air discharge



Fig. 3—View toward west or "take-out" end of degreaser showing the horizontal slot exhaust and grille.

was through a 9 inch round exhaust duct terminating outside the building. A thin plate orifice was placed in this duct 6 feet from the fan and was provided with connections to a manometer for measuring total airflow through the system.

#### Procedure

The cycle of operation for this type of degreasing equipment is as follows: Immerse parts in boiling solvent in chamber A for 15 to 25 seconds or until free of oil or grease; transfer work slowly to rinsing chamber B for 5 to 10 seconds; transfer work slowly to chamber C for immersion in solvent vapor for about 15 seconds for final rinse by condensation on the cooled metal surfaces; remove work from this chamber slowly (manufacturer recommends a rate not exceeding 11 f.p.m.) so as to cause as little disturbance as possible to the solvent vapor level. By leaving parts in the vapor chamber for a few seconds,

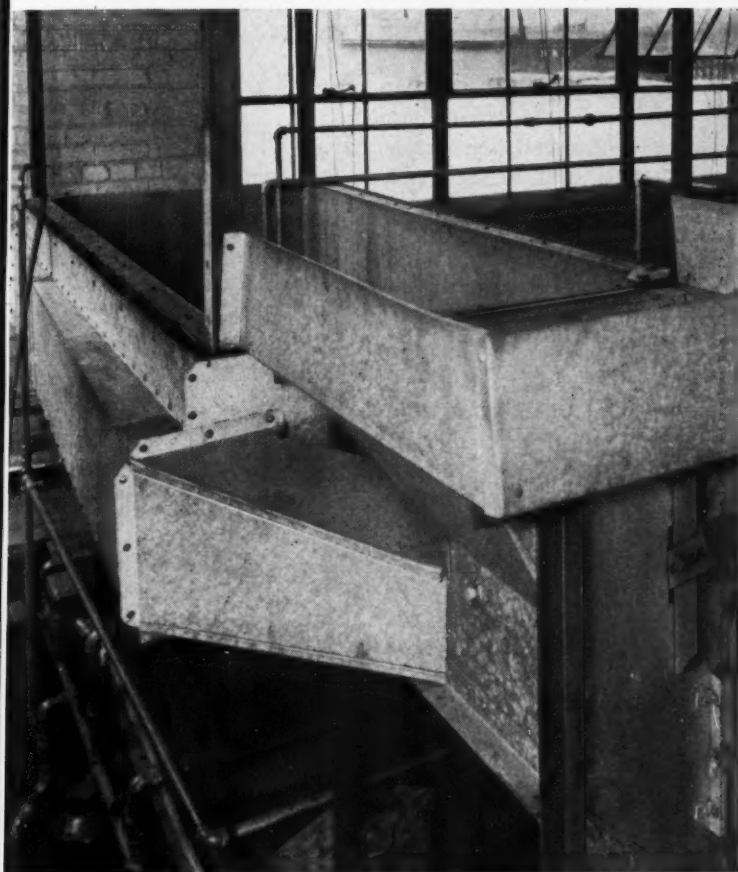


Fig. 2—West end of degreaser showing vertical slot exhaust and general duct construction.

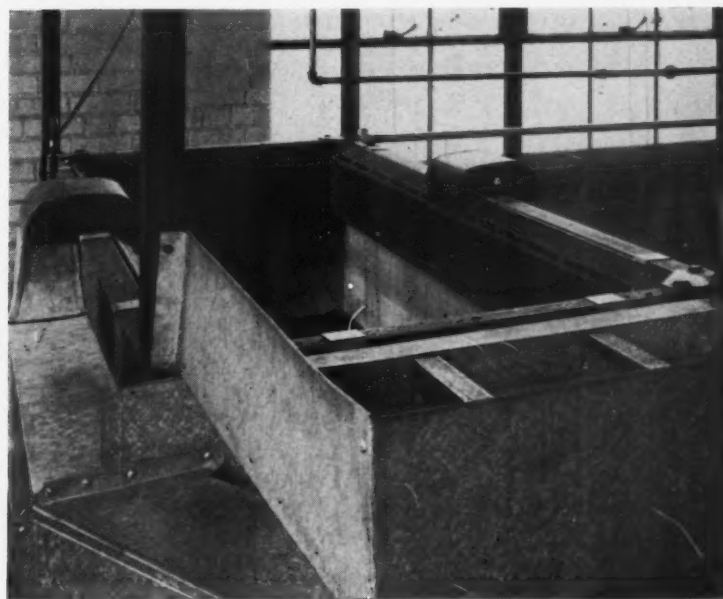


Fig. 4—View toward east end of degreaser showing elongated slot exhaust openings.



they become heated to such a temperature that most of the solvent will be evaporated upon their slow removal from the tank, thus preventing excessive "carry-out."

Trichlorethylene air samples were collected at a rate of 1 l.p.m. by a specially designed combustion apparatus modified from the original described by Tebbens. The resulting samples were analyzed for total chloride by the Volhard method and finally the concentrations calculated in parts of trichlorethylene per million parts of air at standard conditions of temperature and pressure. A total of 243 samples were collected and analyzed representing trichlorethylene concentrations ranging from 20 to 400 p.p.m. The sampling times varied from 10 to 30 minutes with the majority (70%) running 20 minutes or more.

Air samples were collected at the mid-point of

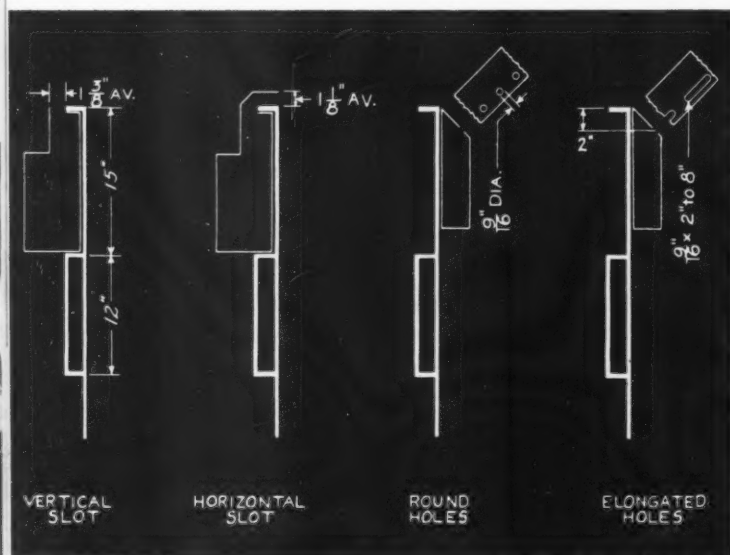


Fig. 5. Diagram of four types of exhaust openings at top edge of degreasing tank. Vertical and horizontal slot types attached outside of tank; round and elongated hole types attached inside of tank.

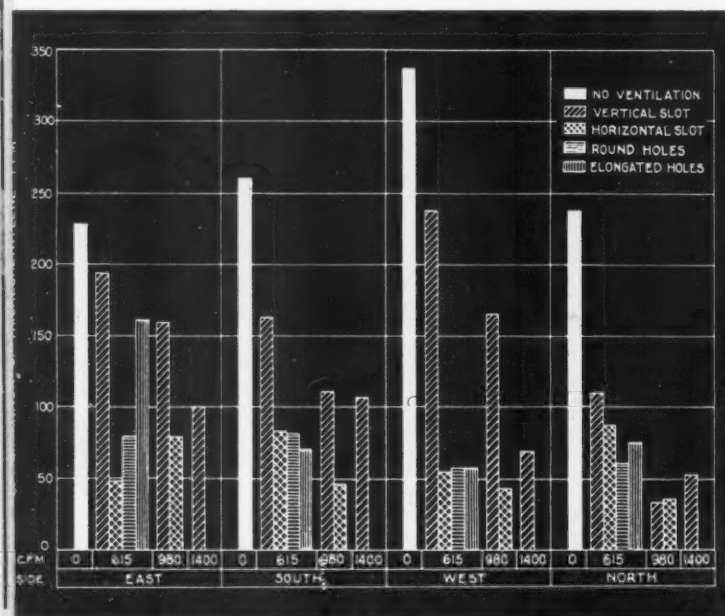


Fig. 6. Reduction of average trichlorethylene exposures in operator's breathing zone with each type of exhaust opening while cleaning parts in degreaser. Results are given for each side of tank.

each side 13 inches above the edge and 6 inches toward the center of the degreaser. This point was predetermined to be the approximate operator's breathing zone for this tank with a 28 inch platform. Exhaust stack samples were collected from a hole in the exhaust duct about 36 inches from the fan. Samples were taken both while cleaning and not cleaning work. During each sampling period, orifice meter and static pressure measurements were checked to assure constant airflow. When work was cleaned, a wire basket containing small parts was run at regular intervals through the cleaning cycle at a rate specified by the degreaser manufacturer. The basket was operated by means of a chain and pulley device attached to an overhead rail.

This procedure was followed at tank edge ventilation rates of 615, 980 and 1400 c.f.m. for the vertical slot, 615 and 980 c.f.m. for the horizontal slot and 615 c.f.m. for the round and elongated hole systems. The volume of air through the grille was held constant at 330 c.f.m. in all cases except when the vertical slot was operated at 1400 c.f.m. in which case the grille was completely closed. The air velocity across the grille opening varied from 80 to 160 f.p.m. at the level where cleaned parts ordinarily would rest.

The distribution of air between the ventilated grille and the slots or holes around the edge of the tank was adjusted by a damper at the base of the grille. The volume of air passing through the slots or holes was measured by observing the static pressure in the branch ducts from the exhaust slots and then reading the corresponding airflow from a calibration graph for the type of exhaust opening in use.

Air velocity measurements were made on each experimental slot to determine air distribution around the tank sides. In addition, point velocity and direction measurements were made for the

TABLE 1

SUMMARY COMPARISON OF FOUR TYPES OF DEGREASER EXHAUST SYSTEMS

	NO VENTILATION	VERTICAL SLOT	HORIZONTAL SLOT	ROUND HOLES	ELONGATED HOLES
Total Ventilation (c.f.m.)*	0	945	945	945	945
Airflow through Slots or Holes	0	615	615	615	615
Airflow through Grille	0	330	330	330	330
Air Velocities at Face of Slots or Holes					
East End	0	220-240	275-300	1540-1630	510-550
West End	0	500-600	600-700	1580-1620	510-530
North Side	0	230-500	300-575	1550-2250	620-2000
South Side	0	250-475	300-575	1550-2250	620-2000
Trichlorethylene Concentration (p.p.m.)†					
East End	229	193	47	80	161
West End	342	238	55	58	58
North Side	237	112	88	62	76
South Side	259	163	83	82	71
Averages	267	177	68	71	91
Static Pressure at Fan Intake (inches of water)		0.15	0.15	0.91	0.77
Power Required without Orifice Meter in Exhaust Duct (air horsepower)‡		0.14	0.14	0.26	0.24

\*Variation in airflow adjustments = 1 1/4% from values given.

†Samples taken at operator's breathing level while cleaning parts. Sampling points were 13" above edge, 6" toward center, and at midpoint of each side of tank.

‡Motor horsepower requirements may be two to four times air horsepower requirements depending on efficiencies of fan and motor.

construction of velocity contours and streamlines. For this work both the "velometer" and "thermo-anemometer" were used. Smoke tubes were used with the thermo-anemometer to determine the direction of air flow.

In order that data collected from day to day would be comparable, variables in the experimental equipment and in operating conditions were kept constant so far as possible. The windows of the experimental room were kept closed at all times and the entrance door (3 feet by 8 feet) at the opposite end of the room was kept open and served as an air intake as well as for traffic in and out of the room. In addition to the experimental degreaser, the room contained a trichloroethylene still and a small ventilated open type degreaser, both of which were in constant use. This equipment contributed 25 p.p.m. of trichloroethylene to the atmosphere in the breathing zone of the operator of the large degreaser as determined by sampling 13 inches above and 6 inches toward the center of the tank when the degreaser was covered and its solvent was at room temperature.

It was attempted to maintain the condenser water on the degreaser at  $90^{\circ} \pm 5^{\circ}\text{F}$  during all experiments by means of an automatic mixing valve on the discharge ( $90^{\circ}\text{F}$  was the optimum temperature determined by the manufacturer). Whenever significant changes occurred owing to faulty adjustments or failure of the water mixing valve, the air samples or solvent loss data were discarded for that particular run.

### Results

Table 1 and Fig. 6 present a comparison of the performance of the four exhaust systems. With the horizontal slot and round hole systems, a total air flow of 615 c.f.m. through the 20 foot perimeter of the tank proved adequate to reduce trichloroethylene exposures from a maximum of 400 p.p.m. to below 100 p.p.m. The elongated hole system was equally as effective as the horizontal slot and round hole types except at the east end, which was probably the result of poor air exhaust distribution around the tank. The vertical slot

TABLE 2

Solvent Replacements and Quantities of Solvent Exhausted with Each Type of Exhaust System

AMOUNT OF VENTILATION C.F.M.*			TYPE OF EXHAUST SYSTEM	SOLVENT EXHAUSTED IN GALLONS PER FIVE, 9-HOUR DAYS†		SOLVENT REPLACE- MENTS ‡
TOTAL	GRILLE	TANK EDGE		NOT CLEANING PARTS	CLEANING PARTS 100% OF TIME	
0	0	0	None	0	0	7.5
945	330	615	Vertical Slot	7.3	7.7	8.6
			Horizontal Slot	5.5	7.8	10.9
			Round Holes	9.9	18.2	11.4
			Elongated Holes	8.0	15.0	—
1310	330	980	Vertical Slot	—	—	9.0
			Horizontal Slot	—	—	10.9
1400	0	1400	Vertical Slot	—	—	8.6

\*Variation in airflow adjustments  $\pm 1\frac{1}{2}\%$  from values given.

†Computed from quantities of trichloroethylene found in exhaust stack samples. Cleaned parts were not placed on grille during stack sampling.

‡In gallons per five, 9-hour days, cleaning parts approximately 20% of time.

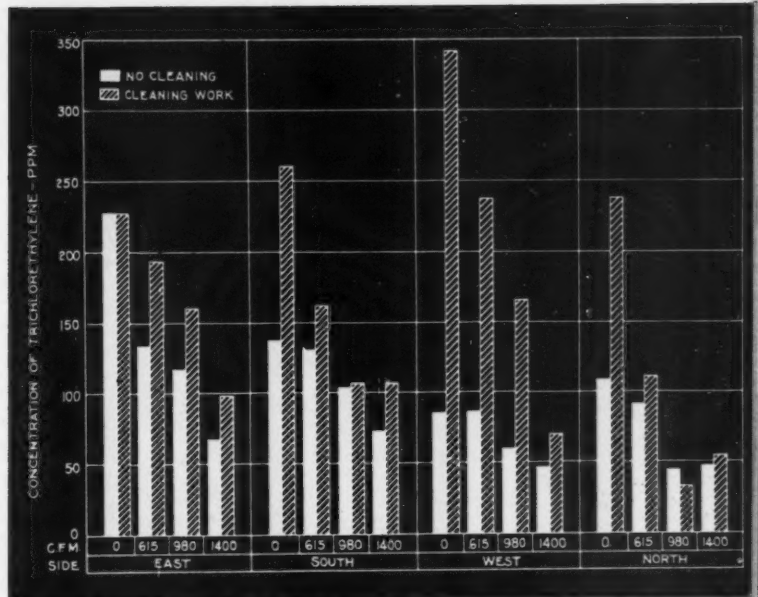


Fig. 7. Average trichloroethylene concentrations in operator's breathing zone at each side tank while cleaning and not cleaning parts in degreaser. Vertical slot ventilation.

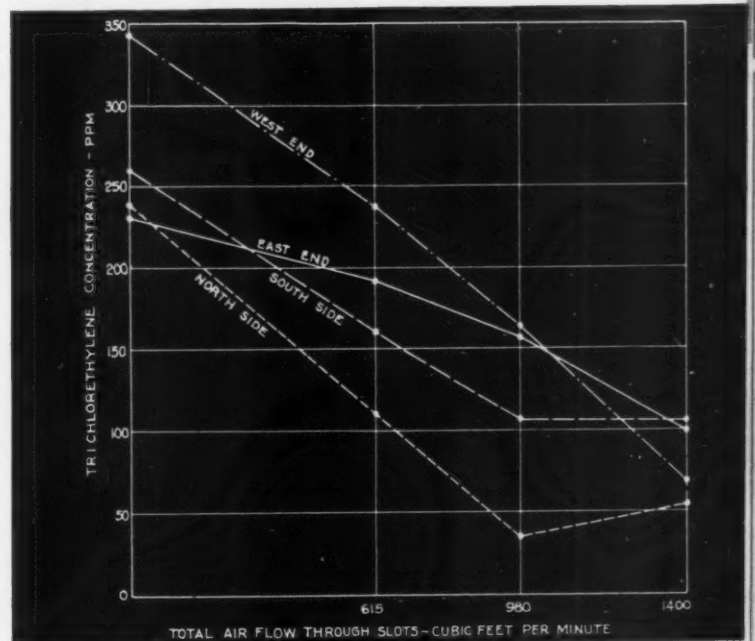


Fig. 8. Average trichloroethylene concentrations in operator's breathing zone with vertical slot ventilation while cleaning parts in degrease

system was least effective in controlling solvent exposures from the standpoint of ventilation rate as it required 1400 c.f.m. to reduce solvent exposures to 100 p.p.m. The round and elongated hole systems required about twice as much power as the horizontal slot system at the same ventilation rate to reduce trichloroethylene concentrations to 100 p.p.m. or less.

The inside and outside types of manifold ductwork constructed for this study are not necessarily recommended as the best types for permanent installation since their design was influenced to a certain extent by convenience of interchangeability from one type of exhaust opening to another.

Table 2 shows solvent losses under various operating conditions as well as the amounts of solvent exhausted to the outside by the different ventilating systems at the lowest ventilation rate.



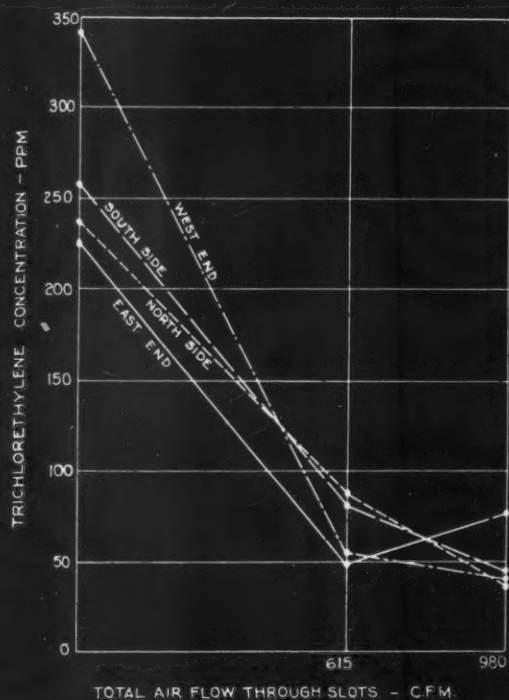


Fig. 9. Average trichlorethylene concentrations in operator's breathing zone with horizontal slot ventilation while cleaning parts in degreaser.

The figures for solvent exhausted were computed from trichlorethylene concentrations in samples of air drawn from the exhaust duct. In general, the amounts of solvent exhausted were higher when cleaning parts than when no cleaning was done in the tank. In 2 cases of a total of 49 stack samples the amounts were higher when no parts were being cleaned.

The actual solvent losses as determined by solvent replacements are given in the last column of Table 2. The vertical slot system did not remove as much solvent from the tank as the other exhaust types, but, as indicated in Table 1 and Fig. 6, it did not fulfill efficiently, from the standpoint of airflow required, the prime purpose of local exhaust ventilation, namely, the removal of solvent vapors from the worker's breathing zone. The round hole and elongated hole types, in addition to requiring more power, appeared also to exhaust more solvent than the vertical and horizontal slot types. The higher solvent losses observed with the round and elongated hole systems may have been due to the location of the holes 2 inches below the inside edge of the tank and thus 2 inches closer to the vapor level than the horizontal slot.

Solvent losses did not vary significantly with the ventilation rate although it is possible that data collected over a longer period of time might have established such a relationship. The application of local exhaust ventilation to the degreaser used in this study increased solvent replacements an average of 0.5 gallon per 9-hour day when cleaning parts approximately 20% of the time. This is equivalent to an increase of 0.3 gallon per square foot of tank opening per 100 hours of operation. At full time operation, ventilation increased the solvent loss on this tank a maximum of 2 gallons per day or 1.2 gallons per square foot per 100 hours. These increases due to ventilation

are small when compared with the increased solvent losses resulting from careless or improper operation of degreasers. A recent survey in New York found solvent losses in practice running from 0.3 to 15 gallons per square foot of tank area per 100 hours of operation, with a median value of 3.5 gallons.

The increase of trichlorethylene concentrations in the operator's breathing zone when parts were being degreased as compared with the concentrations when no work was being done is illustrated in Fig. 7 for the vertical type slot. In general, an increase in ventilation caused a corresponding decrease in trichlorethylene concentration in the operator's breathing zone. The highest trichlorethylene concentrations without ventilation were found over the east or boiling end of the degreaser when no parts were being cleaned, probably because of convectional disturbances. However, with ventilation during the cleaning cycle, trichlorethylene concentrations were highest at the west or "take-out" end except at the maximum ventilation rate.

It appears that a certain degree of non-uniformity of air exhaust distribution around the tank is not necessarily a disadvantage when the system is constructed so that the highest velocities occur at the "take-out" end of the degreaser. This is illustrated in Fig. 8 for the vertical slot system. With no ventilation, the solvent exposures during degreasing were highest at the west end. As ventilation was applied the trichlorethylene concentrations over this end were gradually reduced to the range of concentrations over the other three sides until, at the highest ventilation rate, they were actually lower than those at the east end.

The horizontal slot was not operated at the highest ventilation rate, since the low and intermediate rates reduced the exposures to below 100 p.p.m. (Fig. 9).

(Continued on page 195)

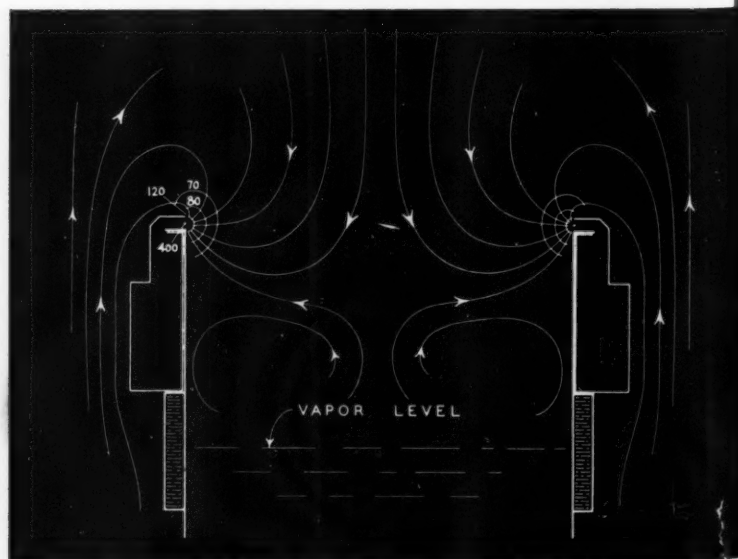


Fig. 10. Velocity contours and streamlines with horizontal slot ventilation. Figures represent air velocities in feet per minute at 0, 1, 2 and 3 in. from slot. Measurements for this set of contours were made at midpoint of sides with a total slot ventilation rate of 615 c.f.m.



# Fewer But Better Finishes\*

By A. L. Pipper  
Manager,  
Manufacturing Service Div.,  
RCA Manufacturing Co., Inc.



The finish chip wall cabinet containing a sample of every RCA Standard Finish is maintained by the Standardizing Division. Each chip bears the identifying number—"RCA Finish No. —."

**F**INISHING is the most expensive single operation in the plant of the RCA Manufacturing Company if improperly done.

No matter how well we have done the job of engineering and manufacturing, the first appeal to the customer is what he sees when he opens the package. A piece of equipment that is scientifically correct and is made to a high standard of manufacturing quality may still produce a dissatisfied customer if the finish is bad.

Prior to standardization, our finishes were designated by name and by number. The numbers consisted of digits followed by letters to indicate revisions or similarities or both.

Two elements in this system caused us some concern. First, use of digits followed by letters, for example, 12 and 12A, was too dangerous. It was too easy to omit the letter and get the wrong finish. Second, a factor which operated against letter designations in our case was the difficulty of transposing letters into numerals in Accounting Department for use with tabulating equipment.

As a result, we adopted a three-digit system, which gave us 999 numbers to use. After five years, we still have spare numbers.

We then cross-indexed the old to fit the new so that we would not have confusion in drawings already existent; for example, 12 became 120; 12A became 121; 12B became 122, and so on.

At the end of three years, the system was so well implanted that the cross-index feature was no longer needed to guide our people.

We then started to eliminate the identification of material by the name of the manufacturer. We found that each manufacturer had his own designation for his materials. We might have a stock

of John Doe Company, Black Lacquer No. 45789 and also some XYZ Company, Black Lacquer No. A-7899 which was the equivalent of the other. If the job in question started with John Doe No. 45789, the odds were that it would continue throughout and more material might be purchased even though a stock of XYZ Black Lacquer, No. A-7899 was actually on hand.

## Set Up Own Sample System

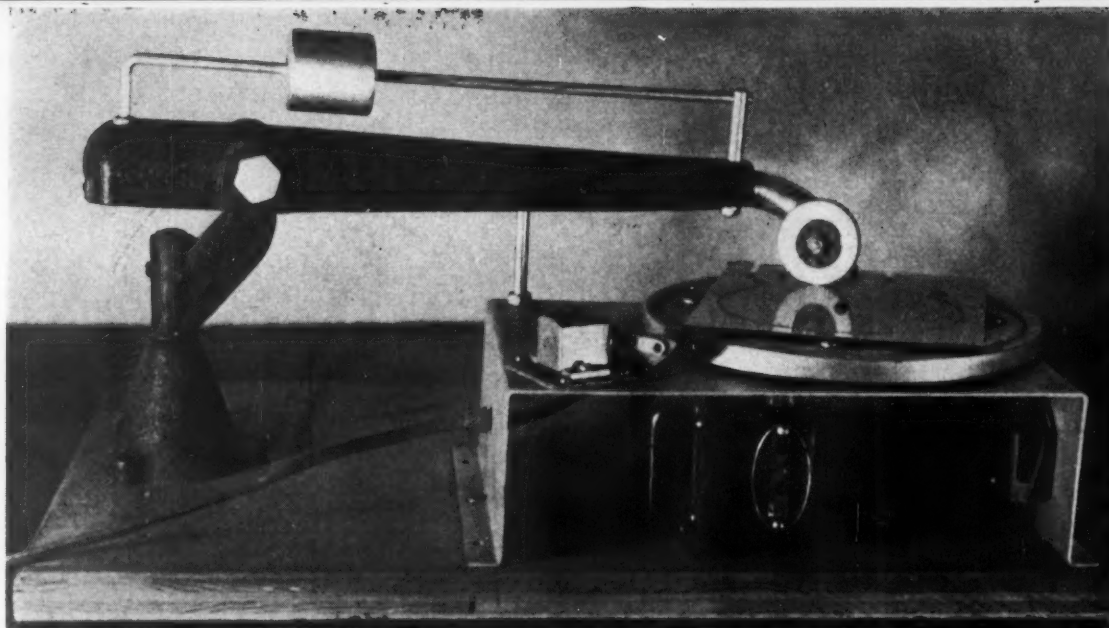
This problem was not easy to solve. We did it this way: First we eliminated all reference to the manufacturer in our Standardizing Notices and spoke only of "Finish Number —." Next we requested that all samples and all production quantities be marked with our number by the manufacturer. We did not object to his number appearing so long as "RCA No. —" also appeared on the container.

In cooperation with our Purchasing Department, arrangements were made that all requests for samples of new finishes would clear through the Standardizing Division before any action was taken.

Please note that we put no restriction on who asked for samples. We are a large company and many sections have matters of finish to consider. To say that new materials could be ordered only by the Standardizing Division would have impeded progress and probably defeated the program we had in mind.

We also found we had the normal condition of departmental preferences for material from a specific manufacturer. This is always a factor. If the foreman is getting good results from a certain material he is likely to feel that the material then on hand is the essential element. Our prob-

\*Address, by author, to Industrial Management Counsel, Rochester, N. Y., December 3, 1940.



A circular typist's rubber eraser wipes on the finish sample which is revolved by the turntable. Four ounces of pressure is standard wear test for abrasion. The text explains the standard wear for satisfactory finishes.

lem was to break down that feeling, but we knew that when we did we must also give the foreman a material he could use to produce in accordance with his quality limits and his production schedules.

We also found it impossible to transfer information by words either spoken or written. Such terms as "light blue" or "glossy black" or "Moderne Brown" seem to create a different mental picture in everyone's mind.

In view of these findings our index system was inadequate and, to some extent, dangerous. For that reason we adopted a new system of three digits and issued a cross index to cover the matter of drawings and parts already in existence. This avoided the correction and re-issue of old drawings.

#### Too Many Finishes

We had too many finishes but too few of us knew it, so we made some steel panels (we call them Finish Chips) and made an actual specimen of every finish on our list. Then we called together the proper people from Sales, Styling, Engineering, and Manufacturing to decide, with us, on what we wanted to keep and what was superfluous.

We found that many items could be cancelled outright. In many other cases, we found that we could eliminate one finish and take care of the problem with one we retained. As an example, we had nine different specifications for "Black." We recognize there are shades of black but nine were too many. We now have three.

As everyone knows, descriptive terms do not adequately describe color. If I say "we have a Standard Brown," you will naturally want to know "What shade of Brown"?

So we devised a wall cabinet, slotted to hold our regular 3 x 5 panel or finish chip. These cabinets were provided for each section where the question of finish for merchandise is determined. Each cabinet contains a sample of every Standard Finish identified by "RCA Finish No. —." The Standardizing Division maintains these cabinets and keeps them up to date.

Now, the Stylist, or the Sales Manager, or the Engineer can decide by actual visual observation whether or not a Standard Finish, already existent, will be adequate for the job he has in mind. If the standard is adequate, he merely turns it over and specifies "RCA Finish No. —" from the identifying number. If his job can not be handled with an existing standard, he calls in Standardizing and we take over the problem.

Next, we found that our processes were not sufficiently definite. We said "clean" but we didn't always say "how clean and with what cleaner." We said "reduce with thinner" but not always with what thinner or how much thinner to use.

This meant the preparation of Standard Finish Notices which are complete processes in themselves. Every step of the process is given. Those processes which are complete in themselves are made the subject of a separate Standard Finish Notice and are referred to in the individual notices.

We did not have an adequate system of determining the quality of a given material *before* it was applied to the work. The methods and equipment we were able to find seemed to us to be too complicated and elaborate for our use. It seemed to us that we must evolve, by trial and error, a method which gave us adequate information and was fair to the product of all manufacturers.

The Procedure we devised to correct this situation is as follows:

#### Viscosity

We use a #3 Zahn Viscosimeter for determining the correct spraying viscosities for production spraying and for testing of finishing materials.

Materials are reduced to standard viscosities as specified by Standard Finish Notices for the type of spraying to be done.

#### Tests

We have four standard tests made on an RCA standard steel test panel which we use to determine the acceptability of a finish:



1. Abrasion
2. Scratch Hardness
3. Flexibility—Adhesion
4. Coverage and Seconds per Square Foot to Spray

These tests are made 24 hours after the finish being tested has been applied to the panel and results are compared to established RCA standards.

#### 1. Abrasion Test

This test is used to determine the abrasion resistance of the finish. Conditions such as sliding a finished part from one assembly operation to another on the finish surface, sliding a finished part in and out of assembly fixtures, or the abrasive action of the packing paper during shipment of the finished product, all make it especially important that our finishes show a high degree of abrasion resistance.

The abrasion test is conducted on the RCA standard abrasion machine which consists of a turntable that revolves at 78 to 80 rpm.

Mounted at 15 degrees off center and supported by a balanced arm is a circular rubber eraser of the type generally used by stenographers. The test panel, which has been sprayed with the finishing material being tested, is placed on the turntable with the finish side up.

We adjust the rubber eraser so that it revolves easily. The angle wiping action of the eraser wears away the film being tested, and allows the eraser to be self-cleaning.

The arm which holds the eraser is balanced so that a pressure of four ounces is obtained at the eraser by moving the weight located on the eraser-supporting arm. When the correct pressure is obtained at the eraser, the weight is locked in place with a thumb screw.

As the panel revolves, the eraser wears the finish and a circle shows where the finishing material is removed. For Air Drying finishes the following table is used:

Up to 200 revolutions	= poor
200 to 300 revolutions	= fair
300 to 400 revolutions	= good
400 to 500 revolutions	= very good
500 and over revolutions	= excellent

If an unusual number of revolutions is recorded it may indicate a very heavy film thickness and this will reflect in a lower coverage per gallon of material.

For Baked finishes the following table is used:

Up to 1000 revolutions	= poor
1000 to 1500 revolutions	= fair
1500 to 2000 revolutions	= good
2000 and over revolutions	= excellent

This test is stopped when 2000 revolutions have been reached.

#### 2. Scratch Hardness Test

This test is used to determine the hardness of a finish. Finishes that are too hard have a tendency to be brittle and can not stand shock or blows without chipping. Finishes that are too soft mar easily and can not stand packing or abuse without showing print marks of the packing.

The equipment used consists of a counter-balanced arm and pressure weight. On one end of the balanced beam is a phonograph needle. The beam is notched and as the 1 lb. weight is moved towards the needle it increases the weight on the needle until it pierces the film being tested.

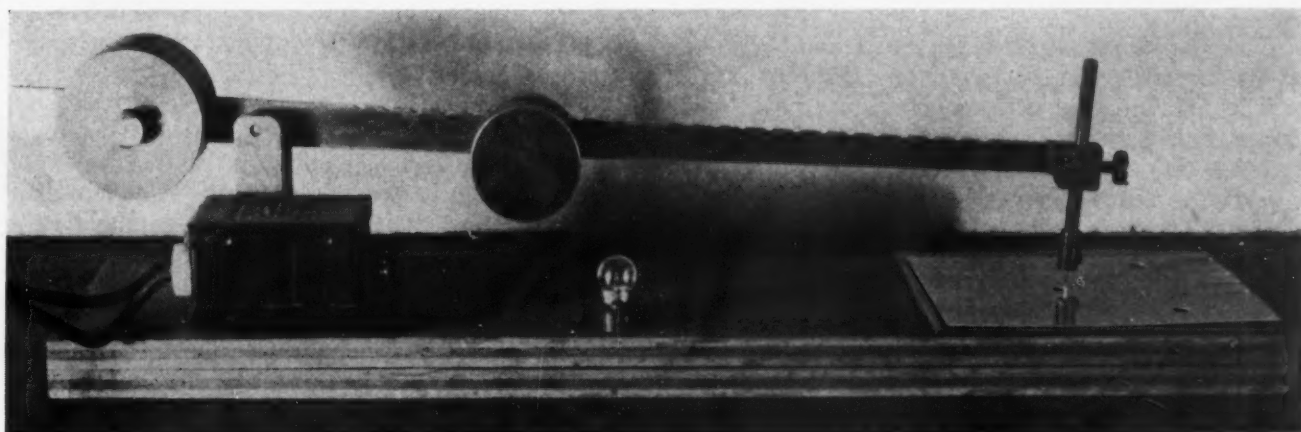
The test panel is placed under the needle and drawn towards the operator. The weight on the beam should be moved forward one notch at a time and the panel observed after each forward movement until the film is pierced.

When the film is pierced the needle will complete a circuit to turn on a light. We check the needle frequently to see that it is sharp and we change it when necessary to maintain a good sharp point.

For Air Drying finishes the following rating table is used:

Up to the 5 notch	= poor
Up to the 6 notch	= fair
Up to the 8 notch	= good
Up to the 10 notch	= very good
10th notch and over	= excellent

For Baked finishes the following rating table is used:



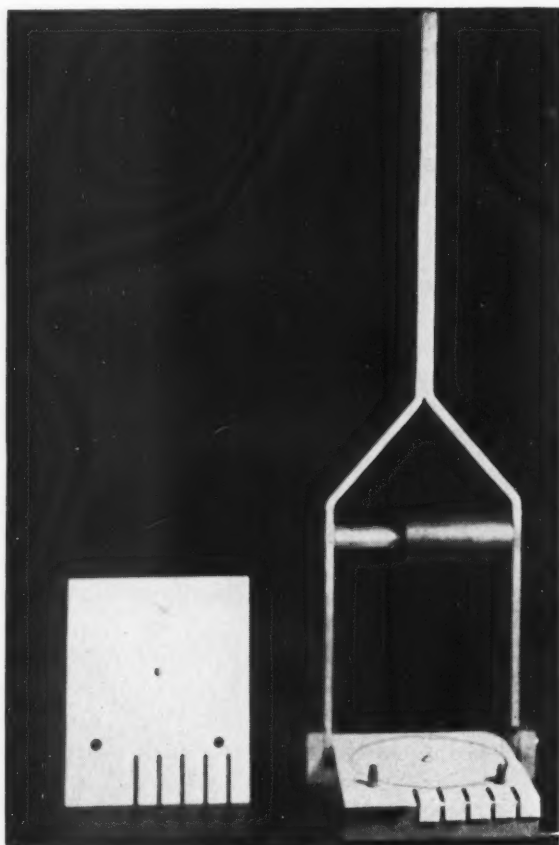
A phonograph needle in this simple tester determines how hard a finish is. The weight on the arm is moved forward notch by notch until the needle pierces the finish. The lamp lights when the finish is pierced. The text explains the standard measurement by number of notches.



Up to the 9 notch = poor  
 Up to the 11 notch = fair  
 Up to the 13 notch = good  
 Up to the 16 notch = very good  
 16th notch and over = excellent

### 3. Flexibility and Adhesion Tests

This test is used to determine the flexibility and adhesion of the finish. The test panel is placed in the flexibility fixture finished side up and clamped in place. The handle of the fixture, equipped with a roller, is drawn down over the tabs of the test panel. The tabs are bent over radii of different dimensions. ( $\frac{1}{32}$ ,  $\frac{1}{16}$ ,  $\frac{3}{32}$ ,  $\frac{1}{8}$ ,  $\frac{3}{16}$ ).



The flexibility of a finish is tested by drawing down the handle of this fixture and bending the tabs of the test panel over different radii. The text explains measurement for different types of finish.

The *flexibility* of the finish is indicated by its ability to withstand bending at the different radii.

The following table is used for air drying and baked finishes after bending the tabs of the test panel:

If the film is broken on all the radii including the  $\frac{3}{16}$  inch radius the rating is poor.

If the film is broken on all the radii up to and including the  $\frac{1}{8}$  inch radius, the rating is fair.

If the film is broken on all the radii up to and including the  $\frac{3}{32}$  inch radius the rating is good.

If the film is broken on the  $\frac{1}{32}$  inch and  $\frac{1}{16}$  inch radii only, the rating is very good.

If the film is not broken on any radii, the rating is excellent.

The adhesion of the finish is indicated by its ability to adhere on the base over which it is applied.

If the finish is fractured (not broken) at any of the radii and the film can be easily removed by pressure with the thumb nail or equivalent methods, the finish is considered to have *poor adhesion* and if the film can not be removed, the finish is considered to have *good adhesion*.

If the finish is not fractured at any of the radii of the test panel, we make an "X" with the blade of a knife, razor blade, or equivalent, on the flat surface on the finished side of the panel.

If the film can be easily removed, by pressure with the thumb nail or equivalent, at the arrow point sections where the "X" lines cross, the finish is considered to have poor adhesion. If the film can not be removed, the finish is considered to have good adhesion.

### 4. Coverage Tests and Seconds per Square Foot to Spray

This test is used to determine the coverage per gallon of finishing material ready to spray. A 3 ft. x 3 ft. panel (9 sq. ft.) is used as a unit of measure.

The finishing material, reduced to the recommended standard viscosity, is poured into a graduate-type glass jar which is part of the test spraying equipment. This glass jar is graduated in one-half and one-ounce graduations.

Air pressure is set as per standard for the particular types of finishing material. The 3x3 panel is placed in the spray booth and the material applied with the least number of strokes, shutting off the flow of material at the end of each stroke.

The number of ounces of finishing material in the glass jar is checked before and after spraying the 3 by 3 ft. panel and the amount of finishing material used is then computed into square foot coverage per gallon.

The length of time for spraying the 3 by 3 panel (9 sq. ft.) is also noted and this is computed into seconds or fractions of a second per square foot required to spray the material being tested.

The intent of this test is to apply only enough finishing material to give a good commercial finishing job.

From these results we get an arbitrary, but comparable, indication of the square foot coverage to be expected per gallon of material and the time per square foot to apply it. The material being tested is then sprayed on a standard RCA test panel, applying a commercial coat.

We recognize that there is much to be questioned in the tests we make. In our work, the matter of thickness, in most cases, is subject to reasonably wide tolerances.

Color matching is visual and also within reasonably wide limits. The test method we use suits our needs and, since we apply the same test

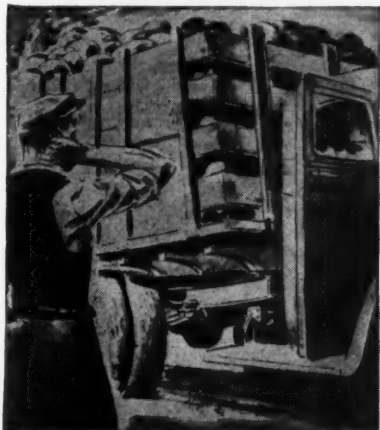
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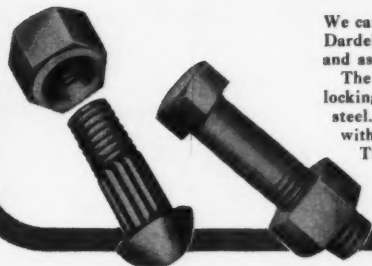
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# Income Taxes, 1942 Style

By Joseph G. Dingle, C. P. A.  
Ottawa, Illinois

SCHEDULE 1  
Individual Income Tax  
Married—No Dependents

Net Income	1921	1932	1936	1940	1941
\$2,500.00..	\$ 20.00	None	None	\$ 11.00	\$ 90.00
3,000.00..	40.00	\$ 8.00	\$ 8.00	30.80	138.00
3,500.00..	60.00	28.00	28.00	52.80	188.00
4,000.00..	80.00	48.00	48.00	74.80	253.00
4,500.00..	100.00	68.00	68.00	96.80	318.00
5,000.00..	120.00	88.00	88.00	118.80	383.00
6,000.00..	170.00	128.00	128.00	162.80	533.00
7,000.00..	230.00	176.00	188.00	250.80	703.00
8,000.00..	290.00	256.00	268.00	338.80	893.00
9,000.00..	360.00	341.00	353.00	448.80	1,103.00
10,000.00..	430.00	431.00	443.00	558.00	1,333.00
12,000.00..	590.00	611.00	638.00	822.80	1,853.00
14,000.00..	770.00	806.00	853.00	1,152.80	2,453.00
16,000.00..	970.00	1,021.00	1,088.00	1,482.80	3,128.00
18,000.00..	1,190.00	1,256.00	1,343.00	1,900.80	3,863.00
20,000.00..	1,430.00	1,511.00	1,633.00	2,384.80	4,654.00

ANOTHER year has just closed. Soon we will be facing the problem of casting up our accounts to determine just where we stand.

This year the average business man is going to find that the tax gatherer is to take a much larger cut in his profits. Particularly is this true of the little fellow. The old slogan, "Soak the Rich," has been taking too large a slice out of the bigger fellow's income for it to be increased much more and still we need money; so this year the "little fellow" is bearing the greater increase.

To present a picture of the tax bill for 1941, we have prepared SCHEDULE I, showing a comparison of the Income Taxes paid by a married man, with no dependents, on business income in amounts ranging from \$2,500.00 to \$20,000.00. For purposes of comparison, we show taxes for 1921, when we were paying for World War I, and for the years 1932, 1936, 1940 and 1941. As will be seen, the fellow with a net income of \$2,500.00 paid \$20.00 for 1921; nothing for 1932 or 1936; \$11.00 for 1940, AND WILL PAY \$90.00 for 1941. This is an increase of over 700% over 1940.

The fellow with \$5,000.00 net income paid \$120.00 for 1921; \$88.00 for the years 1932 and 1936; \$118.80 for 1940 and will pay \$383.00 for 1941. In this bracket, the increase over the prior year is only 222%.

The principal increases are due to the lowering of the specific exemption to \$1,500.00 for a married man—a decrease of \$500.00. The \$400.00 exemption is still allowed for dependents. The surtax which last year started after \$4,000.00 above the specific exemption for family status now starts

with the first penny after the specific exemption, and starting rate is 6%—for the first \$2,000.00; then 9% for the next \$2,000.00, etc. In other words, the rate on the first income over the specific exemption is 4% normal tax—after the Earned Income Credit of 10%—plus 6% surtax. To illustrate this, we take a net income of \$3,500.00 as follows:

Net Income .....	\$3,500.00
Specific Exemption (Married, no dependents)...	1,500.00
Surtax Net Income.....	2,000.00
Earned Income Credit.....	300.00
Balance subject to Normal Tax.....	1,700.00
Normal Tax \$1,700.00 @ 4%.....	\$ 68.00
Surtax 2,000 @ 6%.....	120.00
Total Tax .....	\$188.00

To illustrate the stepping up of the Surtax rates, we now show the computation of tax on a net income of \$5,000.00 as follows:

Net Income .....	\$5,000.00
Specific Exemption (Married, no dependents)....	1,500.00
Surtax Net Income.....	\$3,500.00
Earned Income Credit.....	300.00
Balance subject to Normal Tax.....	\$3,200.00
Normal Tax \$3,200.00 @ 4%.....	\$128.00
Surtax \$2,000.00 @ 6%.....	\$120.00
1,500.00 @ 9%....	135.00
Total Surtax .....	\$255.00
TOTAL TAX .....	\$383.00

As a further illustration, we now compute the tax on a net income of \$20,000.00 as follows:

Net Income .....	\$20,000.00
Specific Exemption (Married, no dependents)...	1,500.00
Surtax Net Income.....	\$18,500.00
Earned Income Credit.....	400.00
Balance subject to Normal Tax.....	\$18,100.00
Normal Tax \$18,100.00 @ 4%.....	\$ 724.00
Surtax \$2,000.00 @ 6%.....	\$120.00
2,000.00 @ 9%.....	180.00
2,000.00 @ 13%.....	260.00
2,000.00 @ 17%.....	340.00
2,000.00 @ 21%.....	420.00
2,000.00 @ 25%.....	500.00
2,000.00 @ 29%.....	580.00
2,000.00 @ 32%.....	640.00
2,000.00 @ 35%.....	700.00
500.00 @ 38%.....	190.00
Total Surtax on \$18,500.00.....	\$3,930.00
TOTAL TAX .....	\$4,654.00

## "Earned Income" Allowance

From the above computations, it will quickly be seen that the rates are quite high and it is therefore necessary to compute income carefully. Taking the net income of \$5,000.00, it will be seen that the last \$1,200.00 of income is taxed at 4% normal tax and 9% surtax, or a total of 13%—just thirteen cents out of each dollar. On a net income of \$20,000.00, the rate on the last \$2,000.00 (From \$18,000.00 to \$20,000.00) carries a combined rate of 42% (4% plus 38%).

Attention is called to the use of \$300.00 as "earned income credit" in the computations of tax on incomes of \$3,500.00 and \$5,000.00, and only \$400.00 in the computation of the income tax on the \$20,000.00 income. This credit is allowed on "earned income" such as wages or salaries; and the Act provides that where the net income is \$3,000.00 or less, such income shall be considered as "earned" and the credit allowed on net income regardless of its source.

Where income is the result of the use of capital and labor, such as an individually owned business, not more than 20% of such income is presumed to have been earned as "salaries or wages" and it is on this 20% that the 10% Earned Income Credit is computed. In the smaller computations, the flat rate of \$300.00 is used—being 10% on the first \$3,000.00 of income. In the computation of tax on the \$20,000.00 income, we have used an Earned Income Credit of \$400.00, which is computed as follows: Net Income of \$20,000.00—20% presumed to be "earned." We have as "earned income" \$4,000.00, and 10% of this is \$400.00, the amount used as the "Earned Income Credit."

The Revenue Act of 1941 is a patched-up affair, using as a basis the older Revenue Acts and superimposing upon them increased rates; decreased exemptions, and a few new taxes. Generally speaking, the computation of net income is to be made in the same manner as has prevailed in the earlier Acts. There are a few new wrinkles in the Revenue Act of 1941, but they are not such as will apply to the average small business man.

### Beware the "Short Form" Report

One of these new wrinkles is the so-called "Short Form Tax Return," whereby a taxpayer having income of not more than \$3,000.00 from SALARY, WAGES, DIVIDENDS, INTEREST, RENTS, ANNUITIES or ROYALTIES, may use the simplified tax return form. This form is not usable for business income, gains from dealings in property, or income from partnerships or trusts, therefore is of little interest to business men, even those whose net income is less than \$3,000.00.

This "Short Form" permits a taxpayer of the permitted class to fill in his name and address, state his occupation, fill out data pertaining to his family status at the END of the year, put down his salary, wages or compensation, or such

other permitted income, and after deducting the proper allowance for dependents, turn to a table on the back of the form and find the bracket in which his final "Income Subject to Tax" falls and there determine the amount of tax due. This tax bracket is in two columns, one for single persons, the other for married persons.

The income tax is computed in brackets of \$25.00, and if a man's taxable income is, say, \$1,976.00, he will be taxed the same amount as if his income were \$2,000.00. This tax schedule is computed to allow the taxpayer deductions for such items as taxes, interest, contributions, etc., a flat 10% of his net income less his specific exemption of \$750.00, or \$1,500.00, depending upon his marital status. If, however, a taxpayer of such class as is permitted to use this "Short Form" has deductions in excess of 10% of the basis, as explained above, it is more advantageous for him to use the regular form and compute the actual tax. This is also true if his income is just a few dollars above the low point of the bracket, such as the illustration used above, where income of \$1,976.00 is taxed as \$2,000.00.

In order that we may make ourselves clear on this "Short Form" we here illustrate the computation of taxable income, of the permitted class, in one column using deductions of 10%, as is used in the short form computation, and in the next column, we have used deductions in excess of 10%.

Net Income from Salary, Wages (permitted class) .....	\$2,500.00	\$2,500.00
Taxes, Interest, Contributions.....	100.00	150.00
Net Income .....	\$2,400.00	\$2,350.00
Specific Exemption (Married, no dependents) .....	1,500.00	1,500.00
Net Income subject to Surtax.....	\$ 900.00	\$ 850.00
Earned Income Credit (10% of \$2,500.00) .....	250.00	235.00
Balance subject to Normal Tax.....	\$ 650.00	\$ 615.00
Normal Tax \$650.00 @ 4%.....	26.00	
615.00 @ 4%.....		24.60
Surtax \$900.00 @ 6%.....	54.00	
850.00 @ 6%.....		51.00
TOTAL TAX .....	\$ 80.00	\$ 75.60
Savings, by use of standard form.....		\$ 4.40

In using the short form, the taxpayer would find, in column B, on the tax form, the amount of his tax, \$80.00. To continue this illustration, we will use as net income the amount of \$1,976.00, just \$1.00 above the \$1,975.00 bracket.

Net income from Salary (permitted class).....	\$1,976.00
Taxes, interest, contributions (10% of \$476.00)...	47.60
Net Income .....	\$1,928.40
Specific Exemption (Married, no dependents)....	1,500.00
Net Income subject to surtax.....	\$ 428.40
Earned Income Credit.....	192.84
Balance subject to Normal Tax.....	\$ 235.56
Normal Tax 235.56 @ 4%.....	9.42
Surtax \$428.40 @ 6%.....	25.70
Total Tax .....	\$ 35.12



## Corporation Tax Schedule

Turning now to the Tax Table on the back of the "Short Form," we find in Column B in bracket \$1,975.00 to \$2,000.00—tax of \$37.00, an amount \$1.88 greater than the computed tax of \$35.12. Thus, it would pay to use the standard form and pay the tax of \$35.12.

For those who operate their business under corporate form, we present SCHEDULE II, using for the purpose of tax computation a corporation having an invested capital of \$50,000.00, and also a declared value (for Capital Stock Tax purposes) of \$50,000.00. Several years ago, corporations were deprived of the usual specific exemption and now they are subject to tax on the first dollar of their net income. Corporations are, under the Revenue Act of 1941, subject to FOUR taxes computed upon the net income. We shall discuss each of these taxes separately:

**NORMAL TAX:** A corporation having net income of \$25,000.00 or less, is subject to normal taxes at the following rates:

First	\$ 5,000.00 @ 15%	\$ 750.00
Next	15,000.00 @ 17%	2,550.00
Next	5,000.00 @ 19%	950.00
	<b>\$25,000.00</b>	<b>\$4,250.00</b>

This tax of \$4,250.00 is equal to 17% of the \$25,000.00. The next bracket is 24%, but for income from \$25,000.00 to \$38,461.54, or \$13,461.54, the rate is 37%, which equalizes the rate to 24%. For income above \$25,000.00 and less than \$38,461.54, the rate really penalizes the corporation. The rate of 37% applies to the first dollar above \$25,000.00, up to and including the \$13,461.54, and after that figure of income is reached, \$38,461.54, the rate is a flat 24%. In other words, a corporation having a net income of \$30,000.00, would compute its normal tax as follows:

\$25,000.00 as above	\$4,250.00
5,000.00 @ 37%	1,850.00
<b>\$30,000.00</b>	<b>\$6,100.00</b> or slightly more than 20%
To continue the illustration, assume an income of \$38,461.54:	
\$25,000.00 as above	\$4,250.00
13,461.54 @ 37%	4,980.77
<b>\$38,461.54</b>	<b>\$9,230.77</b> —a flat rate of 24%

Thus a corporation having income above \$25,000.00 but less than \$38,461.54 will pay a composite tax ranging from 17% up to 24%, and a corporation having income of \$38,461.54 or more will pay a flat rate of 24%.

**SURTAX:** This is a new tax in 1941, and is on all net income, including some classes of income heretofore exempt from taxation, such as interest on United States Government obligations. The rate is 6% on the first \$25,000.00 of income and 7% on all income over \$25,000.00.

**DECLARED VALUE EXCESS PROFITS TAX.** This tax is the same as heretofore except

		SCHEDULE 2				
		Corporation	\$50,000.00	Invested Capital		
			\$50,000.00	Declared Value		
Net	Income	1921	1932	1936	1940	1941
\$2,000.00..	None	\$ 275.00	\$ 160.00	\$ 297.00	\$ 420.00	
3,000.00..	\$ 125.00	412.50	270.00	445.50	630.00	
4,000.00..	250.00	550.00	380.00	594.00	840.00	
5,000.00..	375.00	687.50	490.00	992.50	1,400.00	
6,000.00..	500.00	825.00	600.00	1,407.50	2,046.00	
7,000.00..	625.00	962.50	710.00	1,822.50	2,692.00	
8,000.00..	750.00	1,100.00	820.00	2,237.50	3,371.00	
9,000.00..	875.00	1,237.50	930.00	2,652.50	4,083.00	
10,000.00..	1,000.00	1,375.00	1,040.00	3,067.50	4,795.00	

that the rate is now a single one, while last year it was at 6% and 12% and then 10% added for Defense. The rates are now 6.6% and 13.2%. There is exempt from this tax an amount equal to 10% of the declared value as used in the Capital Stock Tax return, and remaining income, equal to 5% of the declared value, is taxed at 6.6% and all remaining at 13.2%. Thus it pays to declare a high value on capital stock in the capital stock tax return. There the tax is \$1.25 per \$1,000.00 of declared value, and the benefits in computing this particular excess profits tax are: First, an increased exemption of \$100.00 (10% of \$1,000.00) and an increase of \$50.00 of income taxable at the lower rate.

To illustrate: Assume an income of \$10,000.00, and declared values of \$50,000.00 and \$100,000.00.

	\$50,000.00 Declared Value	\$100,000.00 Declared Value
Capital Stock Tax @ \$1.25 per M..	\$ 62.50	\$ 125.00
Computation of Declared Value Ex-		
cess Profits Tax.		
Net Income .....	\$10,000.00	\$10,000.00
Exemption (10% of declared value)	5,000.00	10,000.00
Balance .....	\$ 5,000.00	None
Taxable @ 6.60% (5% of declared value) .....	2,500.00	None
Taxable at 13.2% .....	\$ 2,500.00	None

In the first illustration, the tax is \$2,500.00 @ 6.6%—\$165.00, plus \$2,500.00 @ 13.2%—\$330.00, or a total of \$495.00, while there is no tax under the declared value of \$100,000.00. Thus, by paying \$62.50 additional in Capital Stock Tax, there is a saving in this excess profits tax of \$495.00.

**EXCESS PROFITS TAX:** This is an extra "excess profits" tax, apparently designed to take the profit out of war. There are two bases for computing the exemption; one being on the invested capital basis, the other being on averaged net income for the past four years. If invested capital basis be used, there is permitted an exemption of 8% on invested capital, decreased to 7% on invested capital in excess of \$5,000,000.00. The rates of this tax start at 35% and increase to 60%. In the computation of this tax in SCHED-

(Continued on page 194)



# 290,428 Privately Financed Homes Insured By FHA July 1, 1940-Nov. 22, 1941

FOR the past 17 months, a major portion of the energies of the American residential construction industry has been devoted to the production of new housing to meet the acute need for additional living accommodations in defense production centers where employment has been increasing rapidly and where large numbers of new workers and their families have been moving in from other regions to provide the manpower necessary for successful execution of the defense industry program.

## 290,428 FHA Homes Started

During this period, the volume of residential construction, as measured in terms of dwelling units, expanded to the highest levels since the late twenties. Privately financed construction, concentrated largely in single-family homes, accounted for a considerable share of this expansion. Under the FHA program alone, construction was started under FHA inspection on a total of 290,428 privately financed homes between July 1, 1940, and November 22, 1941.

Furthermore, in situations where private enterprise could not feasibly provide new quarters for defense workers, publicly financed defense housing projects have added substantially to the total volume of construction. By November 1, construction of 48,084 family dwelling units had been completed under the publicly financed phase of the defense housing program. A total of 54,098 additional units were in process of construction on that date and funds had been allocated for 21,197 more, or a grand total of 123,379.

From the standpoint of the total activity of the home-building industry, the expansionist phase of the past year and a half has in all probability now been brought to a close by exigencies of the national defense program. The principal factor pointing in this direction is the actual or threatened shortages of certain basic building materials or equipment, principally metal products for which both the raw material supply and to a lesser extent the available manufacturing facilities are in critical demand for armament production purposes.

While only very minor proportions of the total national production of basic metals have been consumed by residential building even at the peak rates of activity in 1940 and 1941, the need for certain types of metals for armament purposes is so critical that governmental assistance in securing shortage items for use in residential construction is limited to dwellings which can definitely qualify as defense housing. Furthermore, even

for construction qualifying as defense housing, the use of certain critical items is considerably restricted in comparison with normal building practice.

## The Effect of Priorities

These requirements were made effective on September 22 in procedures drawn up by the Office of Production Management, in collaboration with the Defense Housing Coordinator, for securing priorities assistance on certain critical materials for privately financed defense housing. Under these procedures, in order to qualify as defense housing a privately financed dwelling must be located within reasonable commuting radius of the designated Defense Housing Critical Areas and may have a sales price of not more than \$6,000 or a monthly shelter rental of not more than \$50, in addition to meeting other

(Continued on page 198)

TABLE I

New Homes Started Under FHA Inspection in 50  
Defense Areas March 31-October 31, 1941

	TITLE I	TITLE II	TITLE VI	TOTAL
Bridgeport, Conn.	387	48		435
Hartford, Conn.	536	66		602
Camden, N. J.	111	867	429	1,407
Met. Dist. of N. Y. in N. J.	40	3,053	454	3,547
Bethpage—Farmingdale, N. Y.	23	3,603	25	3,651
Buffalo—Niagara Falls	56	1,007	106	1,169
Rochester, N. Y.	50	527	88	665
Staten Island, N. Y.		370	147	517
Philadelphia—Chester, Pa.		4,351	672	5,023
Pittsburgh, Pa.	176	1,383	212	1,771
District of Columbia	69	2,246	258	2,573
Jacksonville, Fla.	23	751	417	1,191
Tampa, Fla.	14	244	148	406
Atlanta, Ga.	13	392	10	415
Louisville, Ky.	140	980	117	1,237
Baltimore, Md.	43	2,382	394	2,819
Nashville, Tenn.		335	433	768
Newport News, Va.	343	311	46	700
Norfolk—Portsmouth, Va.	297	563	558	1,418
Charleston, W. Va.		255	152	407
Chicago, Ill.		2,525	67	2,592
Fort Wayne, Ind.		447	42	489
Gary—Hammond—East Chicago, Ind.		729	88	817
Indianapolis, Ind.		1,215	212	1,427
Detroit, Mich.		9,259	170	9,429
Akron, Ohio		253	206	459
Cincinnati, Ohio		789	6	795
Cleveland, Ohio		1,914	4	1,918
Columbus, Ohio		491	438	929
Dayton, Ohio		686	109	795
Milwaukee, Wis.		718	206	924
Kansas City, Kans.		421	246	667
Wichita, Kans.	40	415	557	1,012
New Orleans, La.		551	100	651
Kansas City, Mo.	12	340	465	817
Omaha, Nebr.		348	384	732
Tulsa, Okla.	15	685	103	803
Corpus Christi, Tex.	19	306	231	556
Dallas—Grand Prairie, Tex.	209	1,150	173	1,532
Fort Worth, Tex.		432	312	744
Houston, Tex.	899	1,084	744	2,727
San Antonio, Tex.	87	567	250	904
Richmond, Calif.	21	693	438	1,152
San Francisco and E. Bay cities	12	5,253	37	5,302
Vallejo, Calif.		469	357	826
Los Angeles, Calif.	181	9,511	2,912	12,604
San Diego, Calif.	33	758	664	1,455
Denver, Colo.	257	920	206	1,383
Portland—Vancouver, Oreg.	49	646	300	995
Seattle, Wash.	126	1,433	615	2,174

† From July 25.

# Income and Expense for the Minneapolis Code

THE question has frequently been asked, since AMERICAN ARTISAN began publication of various heating ordinances, "Can these ordinances be self supporting?" or "What can be expected in revenue received from licensing and permit fees?"

The answer to both these questions is shown in the published Schedule I of income and expense for the Minneapolis Building Department which administers the Minneapolis heating ordinance.

The income and expense has been tabulated for the years 1938, 1939, 1940 and the figures are broken down to show sources of income and, also, where expense goes and in what amounts.

Note that in these three years income from permits increased each year—not much, but Minneapolis in this period did not experience any building boom.

Note, also, that income from licenses dropped off each year. The greatest drop occurred after the first year. This is accounted for by the fact that when the ordinance was put in effect every firm then engaged in heating automatically received a license upon payment of the fee, but after the first year new firms had to pass an examination. Also, some firms could not or did not live up to the requirements of the ordinance and had their license revoked or were asked to take an examination before receiving a new license. Some firms could not pass the examination.

Permit fees are received under seven classifications of license as tabulated in Schedule 11; these seven classifications are, Gravity Warm Air Heating; Mechanical Warm Air Heating; Steam and Hot Water Heating; Sheet Metal Work in

## SCHEDULE I Department of Buildings, City of Minneapolis Income and Expense Analysis for Heating Division

	1938	1939	1940
Permit Fees .....	\$23,361.65	\$24,029.30	\$24,974.00
License Fees .....	11,071.25	8,314.75	8,261.00
Total Fees .....	\$34,432.80	\$32,344.05	\$33,235.00
Inspector's Salaries (*A)...	\$25,167.67	\$21,389.00	\$23,194.90
Auto Maintenance .....	3,597.25	2,974.30	3,222.10
Overhead Salaries .....	5,153.87	4,053.36	4,110.90
Supplies .....	986.79	700.85	664.00
Total Maintenance Cost....	\$34,905.58	\$29,117.51	\$31,192.00
Surplus .....	\$ 5,296.32	\$ 3,226.54	\$ 2,042.90

\*A—Number of inspectors for each classification has varied from year to year, but there has always been at least one inspector in each department. Number is varied according to amount of activity in each department.

## SCHEDULE II Income from Fees, By License Classification

	Gravity Warm Air	Mechancl. Warm Air	Steam & Hot Water	Sheet Metal for Ventilation and A.C.	Stoker Sales	Gas Burner Sales	Oil Burner Sales	Total
1938 ...	\$2,286.00	\$2,699.00	\$2,571.00	\$1,174.00	\$1,961.65	\$8,662.00	\$3,586.00	\$22,971.65
1939 ...	2,316.00	3,745.00	2,571.00	936.00	2,168.55	9,174.75	2,818.00	24,029.30
1940 ...	2,464.00	4,439.00	2,511.00	1,030.00	1,857.05	9,073.95	3,104.00	24,974.00

#1—Includes some gas fitting permits not rightly chargeable to heating division.

#2—Includes \$300.00 for gas and oil burner certificates of approval.

#3—Includes \$495.00 for gas and oil burner certificates of approval.

Conjunction with Ventilating and Air Conditioning Systems; Stoker Sales; Gas Burner Sales; Oil Burner Sales. Schedule 11 shows income from each of these classifications for 1938, 1939, 1940.

Under the Minneapolis ordinance, a license is taken out for operation under each of the above seven classifications. Thus a firm may have a license to sell or do one type of work, but may not have a license to do other work. It is possible, of course, for an organization to hold a license in all seven classifications, but few do.

The license fee is \$25.00 for each classification.

A resume of the permit fees shows that the cost of typical permits is as follows: Install a gravity warm air furnace, \$2.00; Repair or recondition a gravity furnace (not to exceed \$500), \$2.00; Install a mechanical warm air system, \$4.00; Install duct work to a mechanical warm air furnace, \$4.00; To alter or repair a mechanical warm air furnace, \$2.00 (under \$500); Install piping and equipment for cooling (under 2,000 cfm), \$2.00; Alter or repair a cooling system under \$500, \$2.00; Install sheet metal work and duct work in any fan heating system, \$2.00; Install sheet metal work or duct work for a cooling system, \$2.00; Install an oil burner or a stoker, \$2.00. Fees for smaller jobs run down to \$1.00.

The expenses itemized in Schedule 1 show the  
(Continued on page 196)

# Association ACTIVITIES

## Fan Manufacturers Celebrate 25th Anniversary

Organized in February, 1917, the National Association of Fan Manufacturers will celebrate its 25th Anniversary at the Annual Meeting to be held in Detroit, Michigan, February 12, 1942.

Started primarily as a credit association, the scope of the activities has been gradually enlarged during the intervening years to include research, engineering standards, education work in the proper uses of air movers, improved working conditions and other allied subjects.

In cooperation with the engineering societies, the "Standard Test Code for Centrifugal and Axial Fans" was first sponsored by the Association and published for distribution to the public. A certified rating label which may be attached to catalogues or products is now issued to member companies for identification to the buyer that fans sold thereunder have air deliveries obtained in accordance with the Standard Test Code.

Research and study has been made of the effect of erosion, corrosion or the results of excessive heat as well as investigations covering the subjects of Sound, Air Washers and Field Tests of Fans.

A program of standardization has been adopted to cover those types of centrifugal fans designed for application in, and furnished under specifications for the heating, ventilating and air conditioning fields.

Publications of the Association available to the public include Standard Methods Adopted for Centrifugal Fans and Blowers, Standard Test Code for Centrifugal and Axial Fans, Comparison Charts for Planing Mill Exhausters and Cast Iron Volume Fans, Field Test of Fans, The Magic of Fresh Air and Electricity, and Abrasion.

L. O. Monroe, Secretary.

## Kansas City

The Sheet Metal and Heating Contractors Association of Kansas City, Missouri, recently held their annual election of officers. The new 1942 officers are:

J. A. Colin—President  
A. J. Paden—Vice-President  
A. F. Gus Werner—Business Manager  
Hugh Waters—Secretary  
G. W. Blaich—Treasurer  
Sergeant-at-arms—D. Edwards

Trustees—Leslie Burger, Leslie Izard, Everett L. Gilbert

We are sure that these officers will make a success of their opportunities in this organization this coming year as they are outstanding men in the sheet metal industry.

The outgoing officers for 1941 are:

L. B. Higgins—President  
A. F. Gus Werner—Vice-President  
G. W. Blaich—Secretary & Treasurer  
Everett L. Gilbert—Business Manager

Everett L. Gilbert, Business Manager.

## Florida

The 1942 convention of The Roofing and Sheet Metal Contractors Association of Florida will take place in Miami on April 17 and 18. Bill Palmer of Miami is preparing the program and will soon name his committee.

In Tampa on the 15th and in Jacksonville on the 16th, representatives of industrial plants in the State will visit the "Defense Special." This train is designed for the purpose of demonstrating what manufacturers articles are required for National Defense.

L. A. Burgess, Secretary-Treasurer.

## Ohio

At a meeting of the Ohio Sheet Metal Contractors Association held at Cleveland December 18th, it was decided to hold the 1942 convention at the Hotel Carter, Cleveland, on February 24th, 25th, and 26th, 1942.

The Board of Directors of the Ohio association met with members of the Cleveland group, dates were set, and arrangements made covering details.

President Feiten of the State association will act with his local Cleveland group in making up the program and arranging for the entertainment of the visiting contractors. Special effort will be made by the committee to have speakers present that will cover subjects that are of vital interest to sheet metal contractors during these trying times. As our country is now placed upon a war basis, many changes may be necessary in the operation of the sheet metal contracting business as time goes on.

A preliminary committee composed of President Feiten and Treasurer Mannen of the State association and Milton Thesmacher and M. J. Cutter of the Cleveland contractors association has started to work and a full convention committee will soon be announced and working toward a well attended and successful 1942 convention.

C. M. Gundlach, Secretary.

## 1942 CONVENTIONS

Jan. 26-28—National Warm Air Heating & Air Conditioning Association. Annual. Benjamin Franklin Hotel, Philadelphia.

Jan. 26-30—American Society of Heating & Ventilating Engineers, Annual. Bellevue-Stratford Hotel. Philadelphia. A. V. Hutchinson, Secy., 51 Madison Ave., New York City.

Feb. 2-4—United Roofing Contractors Assn. Annual. Hotel Pennsylvania, New York City.

Feb. 24-26—Ohio Sheet Metal Contractors Association. Hotel Carter, Cleveland. Carl M. Gundlach, Secretary, 910 Columbus Ave., Sandusky.

Feb. 3—Sheet Metal and Warm Air Heating Contractors' Association of Indiana, Inc. Antlers Hotel, Indianapolis. Elmer R. Mullin, President, 5517 Bonna Ave., Indianapolis.

Feb. 9-11—Sheet Metal Contractors Association of Wisconsin, Inc. Annual. Hotel Schroeder. Milwaukee. Paul L. Biersach, Secretary, 225 E. Michigan St., Milwaukee.

Mar. 17-19—New York State Sheet Metal, Roofing & Air Conditioning Contractors' Assn., Inc., Annual Convention. Utica, N. Y. Clarence J. Meyer, State Secretary, 567 Genesee St., Buffalo.

Mar. 23-26—11th Annual Forced Warm Air Conference at Michigan State College, East Lansing. Professor Lorin G. Miller, Mechanical Eng. Dept., Michigan State College.

April 8-9—Illinois Sheet Metal Contractors Association. Hotel Jefferson, Peoria. Wm. W. Johns, Secretary, 212 W. Main St., Urbana.

Apr. 17-18—The Roofing and Sheet Metal Contractors Association of Florida. Annual. Miami. L. A. Burgess, Secretary-Treasurer.





# *Every* **REPAIR PART** *Imaginable*

Prepare yourself now for the big repair and replacement business to come this summer and early fall. Furnaces, stoves and boilers that have performed for many seasons will be needing repairs and you'll be able to supply any part for any heating plant, no matter how old, from Northwestern's genuine replacement stock.

Northwestern repair parts will make jobs move faster, and faster moving jobs mean less labor, less cost. The high quality of every piece will assure long life and gain you many additional satisfied customers.

Every kind of repair part you could need is ready and awaiting your order. We suggest you lose no time in writing for further information. Drop us a postcard . . . today!

## **NORTHWESTERN STOVE REPAIR CO.**

MANUFACTURERS OF STOVE, FURNACE AND BOILER REPAIRS

662 WEST ROOSEVELT ROAD

CHICAGO, ILL.

# Association Activities

## New York State

On April 1, 1941, the New York State Sheet Metal, Roofing & Air Conditioning Contractors' Association, Inc., organized their "Group Insurance" and now has 42 members. Managers, Laverack & Haines, Inc., report the heartiest co-operation from these members and bright prospects for a successful Group if a reasonable percentage of the sheet metal and roofing contractors of New York State join the group.

The first six months' experience has been very favorable and profitable, but 42, the present membership, is not enough to assure a continuance of this favorable experience. Rates can not be more than now paid, but membership entitles to participation in the dividends of a successful group. A list of members is available.

"News items for progressive roofing, heating and sheet metal contractors" follow:

Leighton H. Peebles is Chief of the Plumbing & Heating Section of the Civilian Supply Section of the Office of Production Management, Temporary Building "D," Washington, D. C., if you need information on this subject.

Recently approved by F.W.A. is the additional housing site at Lackawanna, N. Y. The site contains about 57 acres on the South Shore Boulevard. 400 dwellings will be erected for Lackawanna steel and air craft factory workers. The project was assigned to U.S.H.A.

The November edition of "Standard Code Application Manual for Gravity Warm Air Heating Systems" is now ready for distribution (price 40 cents). Write to National Warm Air Heating & Air Conditioning Association, 145 Public Square, Cleveland, Ohio.

Do you pay Uncle Sam your share of taxes? The bulletin "Know Your Taxes" is direct from Secretary of the Treasurer of the U.S.A. Uncle Sam doesn't fool with chaps who do not help to beat the Japs.

Our 1942 Convention will be held in Utica, N. Y., on March 17-19. March 17th will be a one day heating school put on by Prof. Lorin Miller of the Department of Mechanical Engineering, University of Michigan (free to all New York State Contractors, complete details later).

Clarence J. Meyer, State Secretary.

## Indiana

The Board of Directors of the Sheet Metal and Warm Air Heating Contractors' Association of Indiana held a Board Meeting December 13th, and after due consideration to the trend of conditions at present and future, it was decided not to have a two or three day convention for 1942, but a one day session at the Antlers Hotel, Indianapolis, on February 3rd.

Speakers' names, and further details on the convention will be released just as soon as arrangements can be made.

Elmer R. Mullin, President.

## Chicago Institute

The 1942 officers of the Furnace-Air Conditioning Sheet Metal Institute are:

President—Ed. Flebrandt  
Vice President—John Novak  
Secretary—R. L. Tippet  
Treasurer—Pete Relf

Directors—Rudy Guenther, John Rauhut, Carl Woerner, Alex Cotteleer, Ed. Schnell and Louis Drehobl

Louis Drehobl, retiring president, offers his whole-hearted co-operation to these men in the trying year ahead and calls upon the members for their earnest help and co-operation.

## Illinois

At a meeting of the officers and directors of the Illinois Sheet Metal Contractors Association it was decided to hold the 1942 convention on Wednesday and Thursday,

April 8th and 9th, at the Hotel Jefferson, Peoria, Illinois.

Our conventions the past few years have been held in January, but oftentimes bad weather conditions were a handicap and for this reason it was decided best to choose the April dates for this year's convention.

Further details as to program, entertainment, etc. will be announced at a later date.

## Wisconsin

The 28th annual convention of the Sheet Metal Contractors Association of Wisconsin, Inc., is to be held February 9, 10 and 11 at the Schroeder Hotel, Milwaukee, with exhibits in the main hall and corridor. The Hon. Carl F. Zeidler, mayor of Milwaukee, will give the address of welcome, with a response by president T. P. Brenner.

### Monday, February 9:

A. G. Bryant, president of Bryant Machine & Engineering Company, Chicago, will speak on the "Post Emergency Period."

K. A. Albrecht, Manager Social Security Board, will talk on "The Old Age and Survivor Insurance Program Under The Social Security Act."

Thomas O'Malley, Regional Director, Chicago, will talk on the "Wage and Hour Act."

C. N. Nessel, Supervisor, Federal Projects Division, Minneapolis-Honeywell, will talk on "Warm Air Heating and The Defense Housing Problems."

Walter F. Simon, Supervisor of Apprentices, Wisconsin Industrial Commission, Madison, will talk on "Apprenticeship Necessity."

### Tuesday, February 10:

Frank Kramer, Kramer Sheet Metal Works, Milwaukee, and chairman of the Apprenticeship Committee, will report.

A. Walters, Walters Sheet Metal Works of Milwaukee, and chairman of the Warm Air Heating and Air Conditioning Committee, will report on the new Heating and Air Conditioning Bible.

### Wednesday, February 11:

Corydon H. Hall, District Manager, Johns-Manville, Chicago, will talk on "National Defense."

G. F. Goodall, representing Williamson Heater Company of Oak Park, Illinois, will talk on "The Future of Air Conditioning."

Harry A. Nelson, Director, Workmen's Compensation, Industrial Commission, Madison, will talk on "Workmen's Compensation, as of Today."

S. Konzo, Special Research Associate Professor, College of Engineering, Department of Mechanical Engineering, University of Illinois, Urbana, will speak on "Developments in Warm Air Heating" with lantern slides.

On Monday evening there will be held a stag card party with prizes, refreshments and lunch in the banquet room. In the English Room will be a Ladies card party with prizes, under the supervision of the Ladies Committee—Mrs. O. A. Hoffmann, Chairman.

On Tuesday evening there will be "A Surprise Night" under the management of the Manufacturers and Jobbers Committee of which M. L. Lavorgna is chairman.

The banquet, followed by floor show and dancing, will be held on Wednesday evening in the Crystal Room.

Paul L. Biersach, Secretary.

## Milwaukee Correction

On page 95 of the December issue of American Artisan, in listing the newly elected officers of the Milwaukee Sheet Metal Contractors Association, we misspelled the name of the secretary. R. V. Mundigler is secretary.

## Fox Valley

The final wind-up of the Minneapolis-Honeywell school and also birthday party for the Fox Valley Furnace and Sheet Metal Association took place on December 2. George Tansil and boys were on hand to answer questions and explain control applications for stoker, oil, and gas-fired equipment.

Fred R. Lamp, Secretary.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

# **WAR FRONT AND HOME FRONT**

**D**EVOTING our energies to the production of direct necessities for defense needs is our main front. This front receives consideration first and has the call on increased output and enlarged plant facilities.

The second front—Furnaces for Defense Housing and Replacement installations—is also vital to the nation.

To meet these needs, Niagara has ready newly-designed units that meet Federal Specifications for low-cost housing, and standard units required to maintain home morale.

Tell us your problems. We will do our utmost to be of assistance to you.

THE FOREST CITY FOUNDRIES COMPANY  
2500 West 27th Street • Cleveland, Ohio

# **NiAGARA**

## **GRAVITY AND FORCED AIR FURNACES**

★ ★ ★ ★ ★ ★ ★ ★ ★ ★



## Association Activities . . .

### Detroit

Sheets, the official bulletin of the Michigan Sheet Metal, Roofing, Heating and Air Conditioning Contractors Association, is to be sent to members gratis for at least the next four months, with news of the local and state industry affairs. N. J. Biddle, secretary, invites members to tell the industry if they like "Sheets." If not, the secretary wants to hear about it, for he has been given the job of getting out "Sheets."

N. J. Biddle, Secretary.

### Chicago—South Side

The Associated Air Conditioning & Sheet Metal Contractors held their annual turkey party on December 17 at the Chamber of Commerce Hall, 11145 S. Michigan Avenue with guests from Chicago's north and west side. The committee was composed of Nick Dexter, Louis Bohlen, Bill Giemann, Howard Mason and John Vandersteeg. Thirty turkeys were raffled, and a good time was reported by those present.

Louis Bohlen, Treasurer.

### Toledo

The Heating, Ventilating and Air Conditioning Society of Toledo, a group of engineers, salesmen, manufacturers' agents, jobbers and contractors, representing all kinds and types of heating systems, apparatus, equipment and appliances, held its monthly "Knife and Fork" meeting on December 15, at the Commodore Perry Hotel. In addition to promoting a spirit of fellowship an interesting and educational subject is presented and discussed at each

meeting, by someone qualified to handle the subject at hand.

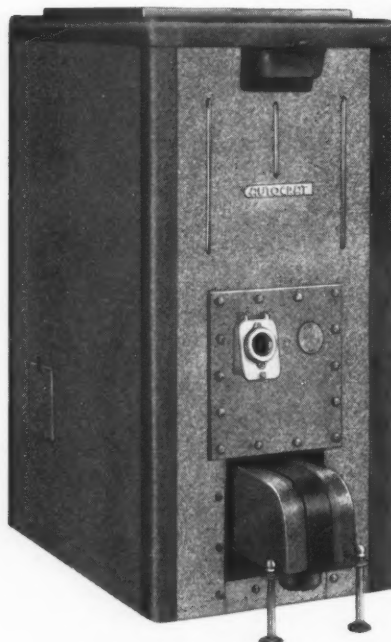
At this meeting G. A. Voorhees discussed "A Closer Correlation Between Engineering and Sales Effort." The speaker believes that the average salesman is strongly inclined to ignore important but easily understood engineering principles; that he who is essentially an engineer is just as strongly inclined to "engineer a job to death"; and, that, only by correlating these essentials can the salesman truly be a Buyer's Counsellor, which after all is his duty to the public. Mr. Voorhees also gave an enlightening discourse on the "Standard Code Application Manual for Gravity Warm Air Systems." This is "Urbana's latest" and can be of great assistance and benefit to the rank and file if they will buy it and use it.

### Material Lists

The National Warm Air Heating and Air Conditioning Association understands that it is now necessary to furnish a material list covering materials on the Defense Housing Critical List when making application for preference rating. These applications are customarily made by the builder or general contractor but cases may arise where manufacturers in our industry may wish to make a copy of the material list available to a builder or contractor. These material lists can be obtained at the following price and from the following office supply house:

1 to 49	.....10	Cents Each
50 to 99	.....6	Cents Each
100 to 199	.....5½	Cents Each
(On quantities in excess of 200 copies, special prices on application.)		

Wirtschafters Incorporated, East 9th Street and Prospect, Cleveland, Ohio.



### CHANDLER-AIRE

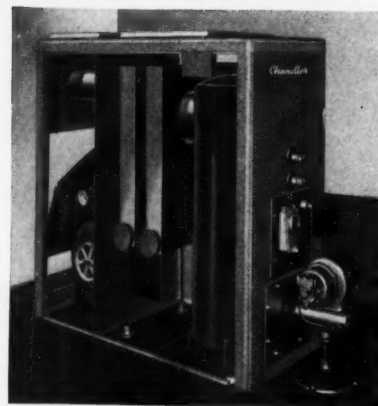
*Gravity and Forced Air Units with Vaporizing Burner*

Equipped with Type "V" Vaporizing Oil Burner, this unit is thermostatically controlled. Small and compact . . . ideally suited for small homes.

## FOR DEFENSE HOUSING! CHANDLER Automatic Oil Heat

### Provides Low Cost Automatic Heat for Small Homes

THESE well-built, highly-efficient Chandler oil heating units are designed to fill the needs of America's defense housing program. For small homes, with or without basements, Chandleraire gravity and forced air units with vaporizing oil burner offer the utmost in automatic heating comfort at amazingly low cost. The Chandler "Series 90" winter air conditioner with pressure atomizing burner is available in several sizes for small, medium, and large size homes. Chandler oil furnaces represent a new high in dependability and heating economy. Dealers in defense areas are especially urged to write today for full details. You can increase your profits and, at the same time, be of vital service in today's defense housing program.

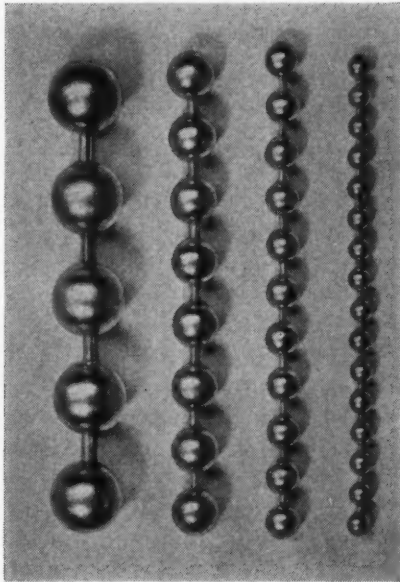


### CHANDLER Series "90" Winter Air Conditioner with Pressure Atomizing Burner

Twenty-five outstanding features make the Chandler "90" superior. Sturdy construction. Low fuel consumption...perfect performance.

# CHANDLER COMPANY CEDAR RAPIDS, IOWA

# BEAD CHAIN\*



No. 20  
BEAD  
CHAIN      No. 13  
BEAD  
CHAIN      No. 10  
BEAD  
CHAIN      No. 6  
BEAD  
CHAIN

Illustrations Actual Size  
Samples on Request

Size No.	Dia. of Bead in Inches	Approx. Tensile Strength in pounds
6	.125	25-30
10	.187	45-50
13	.250	85-100
20	.375	175-200

## MATERIALS

Brass, Bronze, Gilding Metal, "Monel" Metal, Nickel Silver, Aluminum; Chromium, Nickel. Standard attachments as shown, or made to customers' specifications.

• •



## CHAIN AND CORD COUPLING (Actual size)

This coupling, No. 10-V, makes a firm detachable connection between BEAD CHAIN and Venetian blind or sash cord. It is easily applied. For No. 10 BEAD CHAIN only.

\*Trade Mark Reg. U. S. Pat. Off.

BEAD CHAIN\* cannot kink nor tangle. Its swiveling characteristics make it advantageous for regulators and controls with sheet metal fixtures and installations.

BEAD CHAIN\* is most practical for automatic regulation of dampers and ventilators. Specially designed sprockets insure smooth operation.

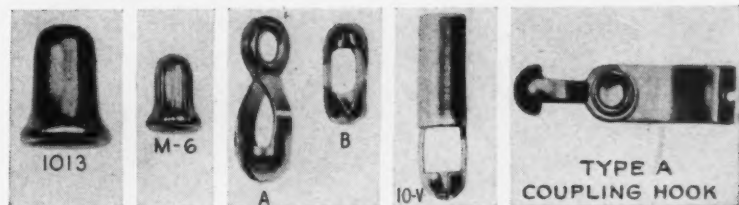
BEAD CHAIN\* may be had in bulk and cut lengths, with couplings and attachments, or in assemblies to meet the specifications of the manufacturer.

BEAD CHAIN\* engineering service is prepared to cooperate fully with manufacturers in the design of assemblies where the use of chain is necessary or desirable.

## DETACHABLE PENDANTS



## NON-DETACHABLE PENDANTS



## COUPLINGS

TYPE A  
COUPLING HOOK



**THE BEAD CHAIN MANUFACTURING CO.**  
BRIDGEPORT CONNECTICUT

## Something To Sink Our Teeth In

(Continued from page 91)

quarters. So far this program, despite governmental pressure, has made slow progress. There are many problems of safety of investment, procurement of funds, availability of materials and labor which must be worked out. That they will be worked out and the program energized seems certain. Certainly the heating industry can expect a very large share in the work contracted under this program.

As for the overall problems of management to meet governmental regulations, we should not expect all the shortcomings to evaporate over night. But we surely know that the men in charge are fully anxious to make the war machine function smoothly and that out of what now seems utter chaos and red tape there will emerge a plan under which each man can do his part to win this war.

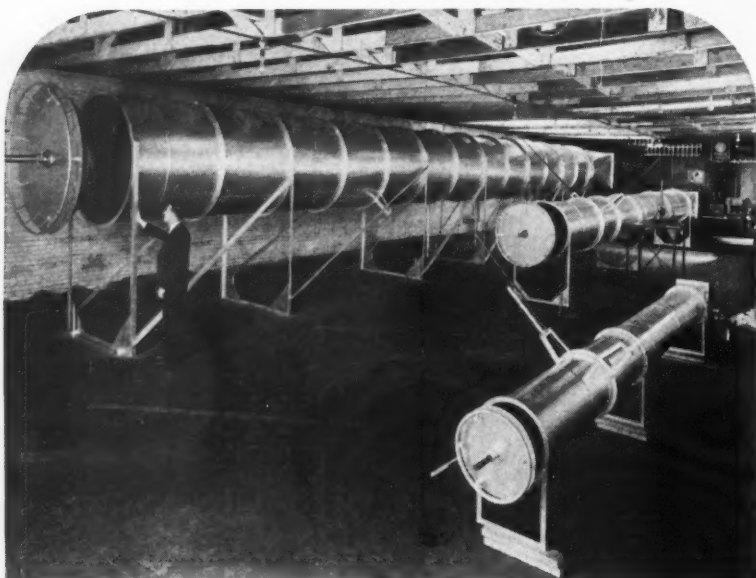
The winter convention of the National Warm Air Heating and Air Conditioning Association in Philadelphia, January 27 and 28 will bring before the industry up-to-the-minute reports of the activities of our industry's Plumbing and Heating Industry Defense Advisory Committee and our Emergency Committee of the Warm Air Furnace Manufacturing Industry.

Also, there will be reports by government chiefs for agencies touching our field such as Defense Housing Priorities, Product Requirements Plan, Contract Distribution. There will not be a heating and ventilating exposition (see announcement on page 91), but there will be a busy and helpful two days and everyone is urged to attend if possible.

For the sheet metal contractor at all equipped to do product manufacturing or ventilating or material waste removal or fume collecting or industrial maintenance, 1941 was an exceedingly busy year. We know for certain that plants for the production of war equipment—big and numerous as they are today—can quite possibly be only a beginning. We know that hundreds perhaps thousands of plants big and little will be requisitioned, commandeered, persuaded to accept war contracts in 1942. Few of these plants are wholly suited now for this change over. Reconstruction of ventilation, fume and waste removal systems promises much work for our contractors.

For fearful souls who want a 1942 stripped of headaches there seems small hope.

But for all patriotic, willing, courageous individuals—and this surely means everyone in our industry—1942 is not to be feared. We, individually and as an industry, together with every other industry—want to and will do our part.



Blowers and fans used in Utility Heating Equipment are all tested in accordance with the A.S.H.V.E. Code, in the extensive laboratories of Utility Fan Corporation. The same careful engineering extends to all design and production of Utility Heating Equipment.

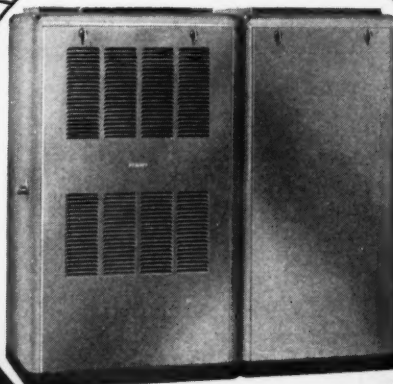
### UTILITY FAN CORPORATION

4851 SO. ALAMEDA STREET • LOS ANGELES, CALIFORNIA

MANUFACTURERS OF FORCED-AIR BASEMENT AND CLOSET FURNACES,  
FLOOR AND DUAL REGISTER FURNACES, CIRCULATING HEATERS AND UNIT HEATERS

## Depend on UTILITY

For modern design and sound engineering... accurate testing in complete laboratories... mass production on modern equipment and efficient assembly lines... helpful factory and sales service.





## Abner H. Ferguson On Housing Need

(Continued from page 92)

in construction of new rental accommodations, I have requested all State and District directors of the Federal Housing Administration to make every effort to induce financially capable sponsors to enter the rental field under the Title VI program. The cooperation of all lending institutions operating under the FHA program in furthering this endeavor would represent a most helpful contribution to national defense.

## Charles F. Palmer On Housing Need

(Continued from page 92)

struction of demountable housing. This type of structure has the desirable features of permanent housing with the additional advantage of removability after the war if it is not needed permanently in its original location.

Private developers who are prepared to construct war housing as defined by the Division of Defense Housing Coordination are being granted priorities assistance under a procedure worked out by the Director of Priorities and the Coordinator of Defense Housing. High ratings are given for remodeling and rehabilitation which adds to the supply of housing without new construction. "Critical areas" where priorities assistance is given to private developers are

recommended by the Coordinator to the Priorities Division of OPM. More than 300 such areas have been approved.

Mortgage insurance up to 90% of the appraised value of the property is available to private developers who meet Federal Housing Administration requirements under Defense Housing Title VI. A total of \$300,000,000 has been appropriated for this purpose.

War housing built by the Government will be for rental, rather than sale. Private developers are being encouraged to build as much rental housing as possible. Higher preference ratings are granted to developers of rental housing than to those of housing for sale.

## W. E. Reynolds On Housing Need

(Continued from page 93)

defense housing projects, set an average and a maximum cost for housing units.

The elimination of basements resulted in considerable saving of the cost of construction, and necessitated installing the heating units either in the kitchen or storage room, or on the living-room floor. The conventional 18-inch furnaces that manufacturers offered required considerably more space than could be allotted, and the necessity for a new design of furnace was apparent.

At the beginning of the program the only available heating equipment was the typical circular cast iron or steel warm air furnace. It required a great deal of floor space. Spurred by the necessity of making every inch of space count, Public Buildings Administration engineers enlisted the help of the heating



# The Most Popular Damper Regulators on the Market!

### Standard E-Z-ON



Illustration about 1/2 actual size. Patent pending.

#### SIMPLICITY ITSELF

No. 27. 1/2 inch bearing. Solid end and tail piece. Packed one dozen in a box. List price 27 1/2 cents per set.

This is the famous E-Z-ON Damper Regulator, so popular with sheet metal men because of the time it saves in making up rattle-proof dampers. Note absence of rivets, screws or cotter pins. Made of steel and heavily cadmium plated.

Extremely simple in application. Slip regulator over edge of damper so points of prongs are over scribed center line, lay assembly on block of wood with hammer and drive prongs through sheet metal with hammer. Now turn assembly over and clinch prongs. That's all there is to it. Prongs are strong enough to easily pierce 20 gauge metal.

#### SELF INDICATING

Position of damper is clearly indicated by tongue on both head and tail piece. This feature makes it possible to set the damper from either side of duct. Also allows working in tight places (next to joists) by simple use of a pair of pliers.

### Snap-tite E-Z-ON



Illustration about 1/2 actual size. Patent pending.

#### IMPROVED REGULATOR

No. 29. 1/2 inch bearing. Tail piece with snap end bearing. Packed one dozen in a box. List price 34 cents per set.

An improvement of the popular E-Z-ON. The same simple means of attaching to sheet metal is used, but the tail piece has a retractable bearing. It is no longer necessary to bend the damper or spring the pipe through insert hole and slide the end with the Snap-tite tail piece over the other hole and it automatically snaps through the hole and LOCKS, free of rattle.



#### INDICATING HANDLES

No. 26 Indicator handle. Steel cadmium plated. 3 3/8 inches long. One dozen in a bundle, one gross in a box. List price 36 cents per dozen.

For those who wish to use indicator handles to more clearly show position of damper, these handles are available. Fit both the No. 27 E-Z-ON and the No. 29 Snap-tite. Not included in regulator sets, but sold separately.

### Note These Features



Drawing shows the patented locking feature of Snap-tite Damper Regulators.

Ordinary snap end bearings have a tendency to rattle because the bearing must be loose enough to allow the spring to push it out. Notice the guiding slot in the housing of a Snap-tite. See how it narrows at one end. The lug on the movable bearing snaps out through the slot and is slightly wider than the narrowest part of the slot. Now when the movable bearing snaps out through the hole in the pipe, the lug wedges securely in the tapered slot, producing a rattle-free bearing. Press on the end of the bearing and notice how it resists pressure, showing that it is firmly locked in position.

#### SPECIAL NOTICE

Snap-tite tail pieces do not operate until assembled to sheet metal. The spring does not function and the movable bearing is completely collapsed when not assembled to a damper. As soon as it is assembled to sheet metal the spring assumes its proper position and the movable end functions.

**M. A. GERETT CORP.**  
 2947 N. 30th Street • Milwaukee, Wisconsin

industry. Manufacturers were enthusiastic about the opportunity of developing a new and smaller and more efficient type of heating unit, and as a result of the splendid cooperation between industry and Government, a unit within a 26" square was developed. It was found to be actually more efficient than the old conventional type furnace. One manufacturer after another joined in the production of this type of heating unit and as a result it has become now an almost universally standard unit. This is another typical example of the fine spirit of cooperation which exists between Public Buildings Administration and industry.

All heating units are installed by contractors constructing the projects, obtaining them direct from the manufacturer nearest to the project.

## Shelby Thompson On Housing Need

(Continued from page 93)

above says:

"Farmhouses of very low value are general throughout the South. In Arkansas, Louisiana, Mississippi, Alabama, and Georgia, the average value of farm dwellings was less than \$500; while in all of the other Southern States, except Virginia, the average value was under \$1,000. . . Information on the value of farm dwellings indicates that in general the most overcrowded farmhouses are those in the regions and States where the average value is lowest."

The Department of Agriculture publication "Minimum Requirements for a Farm Dwelling," lists the

items which are considered minimum requirements. This provides for adequate living space, storage space, kitchen storage, food storage, privacy and convenience, light and ventilation, electric service where available, heating, fuel storage, and water supply and sanitation.

The above gives the *need* for rural housing, but does not encompass any plan for financing the need. Such a plan, with necessary appropriations, would have to come from Congress if a rural housing program is to be publicly financed. The Farm Security Administration makes loans to tenants to buy farms of their own, under an appropriation of \$50,000,000 for the current fiscal year. On farms where buildings are inadequate or where there are none, the loans include funds for construction or repair of buildings. This work is done by private contractors.

The Farm Security Administration is also assisting in the national program for defense housing. Permanent defense housing is performed from funds appropriated in the Lanham Defense Housing Act. Four projects have been allocated to the Farm Security Administration by the Federal Works Administrator. Under two Urgent Deficiency Appropriation Acts, Congress has provided funds for temporary housing for defense workers. Allocations for specific projects are made to the Farm Security Administration by the Defense Housing Coordinator. The Farm Security Administration does not perform any construction work. This is done by contractors to whom bids are awarded.

In houses constructed under the defense housing program of the Farm Security Administration, space heaters have been used for the most part. Some of these have been furnished by the contractors; others have been purchased by the Business Management Division of the Farm Security Administration in



### SAL-MO ASBESTOS DUCTBOARD

#### SAVES METAL

A new asbestos product, developed by Sall Mountain Company for making cold air return ducts for Warm Air Heating Plants. Because it does the same job usually done with metal, it conserves metals for work where metal only can be used.

**EASILY HANDLED**—You save time with SAL-MO DUCTBOARD. Sheet size is 33" x 48"—just right for covering 3 joists spaced at 16" centers, making 2 cold air return ducts. Cut with saw, knife or snips and is speedily applied with hammer and wall-board tacks or with convenient stapler.

**MOISTURE-RESISTANT**—Treated on both sides and on all four edges.

#### SAVES TIME

**FIREPROOF AND NON-CONDUCTOR OF ELECTRICITY**—Made of asbestos, it can be used near electrical wiring without danger.

**ATTRACTIVE IN APPEARANCE**—Easy to keep clean. Can be painted or plastered after installation.

**AVAILABLE IN ANY QUANTITY**—Developed to overcome the growing shortage in metals, SAL-MO DUCTBOARD is available in unlimited quantities and with prompt deliveries.

**YOUR DEALER CAN SUPPLY YOU—SEE HIM WITHOUT DELAY.**

#### SAVES MONEY

**SALL MOUNTAIN COMPANY, 176 West Adams Street, Chicago, Illinois**



*No matter what type  
Furnace your Customer  
wants - you can give it  
to him with . . .*



**I AM SOLD  
ON STOKERS**



**I WANT  
GAS HEAT**



**I WOULDN'T CON-  
SIDER ANYTHING  
BUT OIL HEAT**

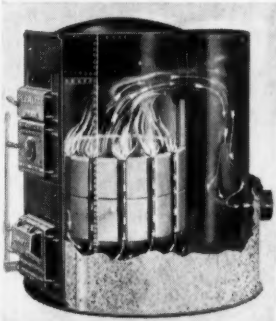
# THE PEERLESS LINE

Most home owners today have definite ideas and preferences when it comes to buying a furnace. Many of them want automatic heat—either gas, oil, or a stoker. Many others—either from preference or to keep within their budget—will consider only the conventional hand-fired furnace.

With the PEERLESS line for 1942, you can give all classes of customers exactly the type and price of equipment they want—from the lowest priced round type furnace to the latest type automatic unit for gas, oil or solid fuel, in modern, streamlined, fully-insulated baked enamel cabinets of unusual beauty.

The completeness of the PEERLESS line, plus the 35 year record of PEERLESS furnaces for economical, dependable service, make a combination that's hard to beat—and easy to sell.

## Round Type Steel or Cast Iron Furnaces . . .



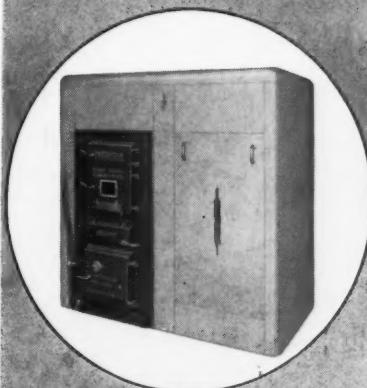
PEERLESS round type furnaces—in either steel or cast iron—are designed and built to give dependable, economical service over a long period of years. These low-priced units carry liberal discounts which make it possible for the PEERLESS dealer to meet any and all competition and still make a profit.

## ★ ★ ★ REPAIR PARTS

Prompt repair service on *all makes and models* of furnaces is one of the best business builders a dealer can have, and can be made one of your most profitable departments. PEERLESS manufactures and maintains a complete stock of repair parts for *all makes* of furnaces. Immediate shipment enables PEERLESS dealers to make quick repairs and thus build good will which can later be translated into furnace sales.

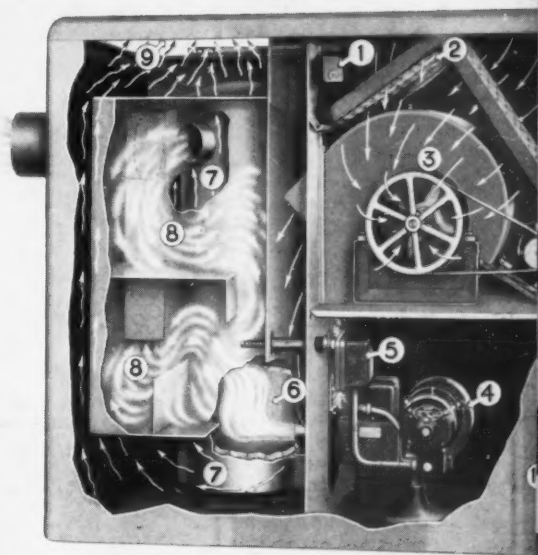
**Complete information on the PEERLESS line for '42 will be sent on request.**

Latest design PEERLESS Stream-liner steel furnace, complete with large, silent blower, filters, automatic humidifier. Truly a Deluxe unit at a remarkably low price. Same unit available for oil or gas. Beautiful baked enamel finish. The stoker, too, is a PEERLESS. Quiet operation, real economy and dependability are guaranteed. Hopper or bin feed.



Here is another exceedingly popular unit in the complete PEERLESS line. A compact, streamlined colorful unit that heats, humidifies, filters and circulates. Designed for stoker or hand firing, it represents the latest developments in efficiency and in economical operation. Cabinet is rich, rust-resisting forest green Morocco baked enamel. A real sales maker for you.

PEERLESS MASTER Automatic Furnace for small and medium size homes. All previous records of efficiency and fuel economy are broken by scientific designing and sound construction. Note the compact simplified arrangement of all the component parts and the intricate maze of baffling in the big radiator that delays passage of flue gas to chimney.



# PEERLESS FOUNDRY COMPANY.

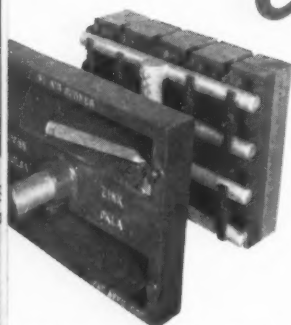
INDIANAPOLIS, INDIANA, U. S. A. • Pioneers in warm air heating for over a third of a century





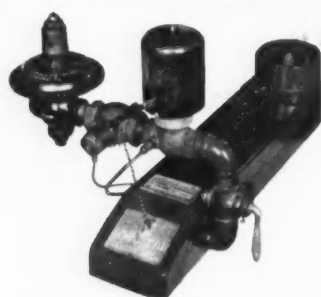
# One Stop Burner Service

## Conversion Burners



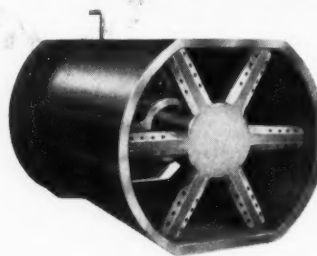
**SERIES "R" BURNER**

factory type gas burner—specially adapted for installing boilers having very low draft and small combustion space.



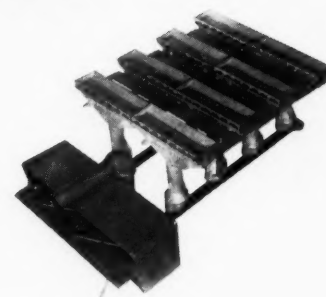
**No. 300 FURNACE BURNER**

Shown with automatic controls—luminous gas flame type. Applicable to 98% of all domestic furnaces, approved, efficient and economical.



**ZINK STAR BURNER**

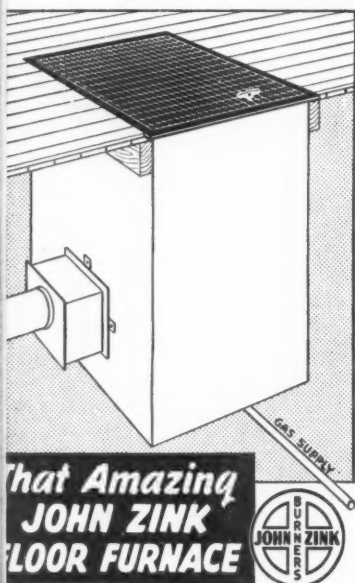
Low pressure, radiating armed spider gas burner. Turns down without blowing out—turns up without vibrating. Applicable to heating or power boilers. Wall type.



**SERIES "V" BURNER**

Pre-Mix gas burner—floor type. Absolutely noiseless — especially good for installations in heating plants, in cantonments, churches, schools and apartments. Sizes for every boiler.

## Floor Furnaces



That Amazing  
**JOHN ZINK  
FLOOR FURNACE**



**FEATURES**—One large gas port, eliminates burner stoppage. Large full length combustion chamber giving uniform warm air temperature without overheat. Proper design makes possible a light air hood which is easily removed for cleaning the furnace. The gas burner is a pre-mix type, made of high grade cast iron, equipped with a pilot light. Automatic controls are available.

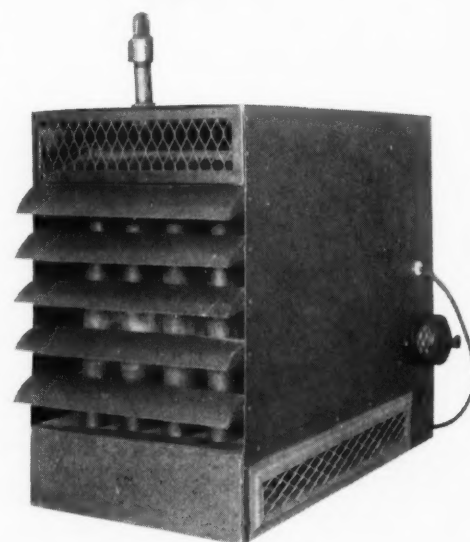
**SIZES:** No. 25 input rating 25,000 B.t.u./hr. No. 30 input rating 30,000 B.t.u./hr. No. 35 input rating 35,000 B.t.u./hr. No. 50 input rating 50,000 B.t.u./hr. No. 70 input rating 68,000 B.t.u./hr. Reasonably priced.

Long life cast iron burner of John Zink's own design and manufacture. Compact design. 100,000 B.t.u./hr. capacity. Equipped complete with built-in controls, including thermostat. Forced circulation provided by a recognized heavy duty electric motor and quiet running fan.

Piping and control equipment are simple and easy to install, and readily accessible. Require little wall room or head way can be suspended from roof trusses.

These new unit heaters are particularly adapted for heating and ventilating large or small spaces in industrial and commercial buildings.

## Unit Heaters



*We also manufacture Gas Burners, Oil Burners, and Combination Oil and Gas Burners for: Domestic Boilers, Heating Boilers, Industrial Boilers and Power Boilers. We are willing and capable of designing and manufacturing special burners for special purposes.*

**JOHN ZINK COMPANY**  
TULSA, OKLAHOMA NEW YORK, N. Y.

Washington, D. C. On January 5, bids will be received by the Farm Security Administration for 1,000 furnaces for defense houses to be built at Baltimore, Maryland.

Heating equipment for the Farm Security's defense homes is installed by the contractors who receive contract awards for the houses.

## Nathan Straus On Housing Need

(Continued from page 93)

bility to look to the future. The housing built for defense workers cannot be permitted to become "ghost towns." Therefore, it is planned to convert USHA-built defense housing to the rehousing of families from the slums at the end of the emergency. At the same time, an equivalent number of slum dwellings would be eliminated in accordance with the provisions of the United States Housing Act. In effect, the community would exchange bad housing for an equal amount of good housing.

And for the post-war time, surveys conducted in 419 areas showed that twenty-nine percent of our homes are now substandard. A cumulative shortage of 10,000,000 homes looms for 1950. Such a program of building cannot be accomplished through private enterprise alone, since private enterprise does not find it profitable to build low-rent housing for low-income families. It will need the combined efforts of private enterprise and public action to accomplish a well-rounded program to rehouse the ill-housed of the Nation.

## Furnace Replacements

The National Warm Air Heating and Air Conditioning Association has been impressing on Washington agencies that approximately 10 million gravity furnaces and winter air conditioning units are installed in homes in the United States, and that the replacements required are between 300,000 and 400,000 per year.

There are no figures now available as a result of any Government survey giving the number of furnace installations in the United States. A reasonable estimate of furnace installations in 1934 (Real Property Inventory), covering both the urban and rural populations was 8,500,000. Since 1934, 2,072,000 furnace and winter air conditioning units have been sold. There are no figures available which show the percentages of furnaces which were sold for replacements and as new furnace in new houses in the years 1935-1940 inclusive. George Boeddener, managing director of the association, believes that 65 percent, or 1,346,800, represents replacements and 35 percent, or 725,000, represent furnaces of all types sold for new house construction.

Taking the figure of 8,500,000 furnace installations up to 1935 and adding 725,000 new installations from January, 1935, to January 1, 1940, gives a total of 9,225,200 furnace installations as of January 1, 1941.

The estimate for all warm air furnace units produced last year (1940) is 531,000. Using the Dodge figures for the 37 Eastern States as a basis and adding 20 per cent to cover the 11 Western States not included in the Dodge survey and making a pure but liberal guess as to the number of houses of less than \$4,000 cost, gives a round figure of 300,000 one and two family houses produced in 1940. Because there are no exact figures available, it can be assumed that 50 per cent of the 300,000 one- and two-family houses used gravity and forced warm air heating, or a total of 150,000 units.

The estimate of all warm air furnace units produced last year is 531,000. If 150,000 units were installed in new houses, the remainder or 381,000 units must have been used for replacements.

# FACTS at your FINGERTIPS

## NEW ILG CATALOG ON PROPELLER FANS

36-page, fully illustrated, colorful catalog picturing complete ILG line of Self-Cooled Motor Propeller Fans (8" to 72") for all purposes. Includes data tables, dimension drawings, wiring diagrams.



## NEW ILG CATALOG ON UNIVERSAL BLOWERS

The complete story on all types of ILG Blowers for ventilating, air conditioning, dust removal, etc. Multi-page, colorful—includes full specifications, performance data, engineering information, etc.

## NEW ILG CATALOG ON UNIT HEATERS

Covers comprehensive ILG lines of horizontal, vertical, low-ceiling and textile-type Unit Heaters—all designed to make 8-way savings while heating the "vital zone"—where people work, shop, or play.



# Vitalized Ventilation

AND AIR CONDITIONING  
AIR CHANGE... NOT JUST AIR MOVEMENT!

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AND MAIL  
TODAY!

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☐ Have your representative call.

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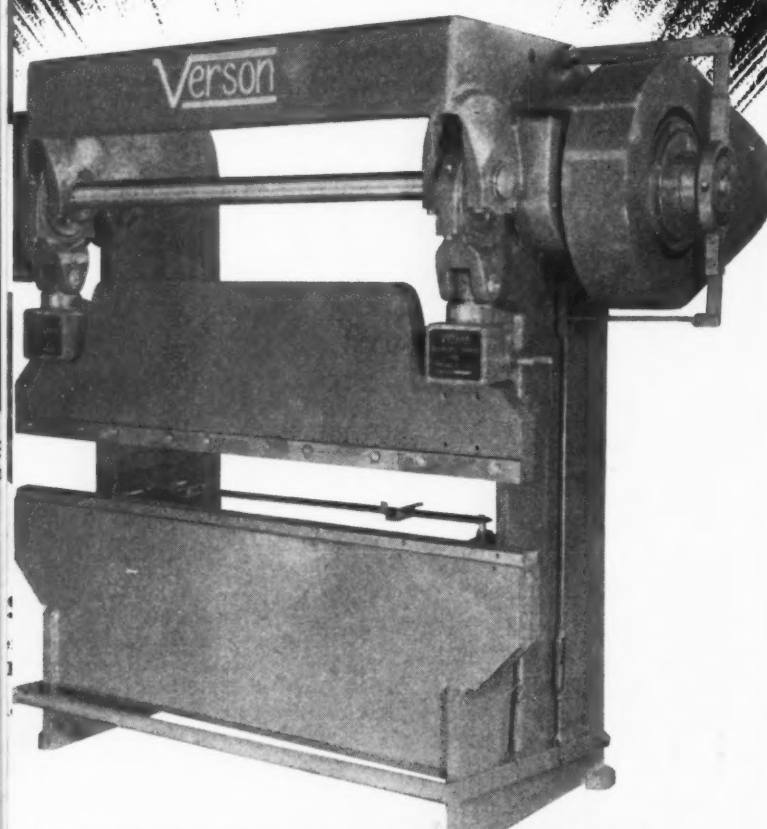
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ADDRESS.....

CITY..... STATE.....



To help you do a  
**BETTER JOB-quicker!**



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**JUNIOR**  
**PRESS BRAKES**

**P**UT one of these POWERFUL, FAST and VERSATILE "Juniors" on the job—you'll get things done smoothly and efficiently. This series in the Verson line was designed and built to give "big machine" performance at "small machine" economy.

There are many features of the Verson Junior that offer advantages in solving your problems. Write for bulletin JPB40; it gives full details.

**ERSON ALLSTEEL PRESS CO.**  
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## Income Taxes 1942 Style

(Continued from page 179)

ULE II, income of \$10,000.00, this tax is as follows:

Net income .....	\$10,000.00
Exemption (8% of \$50,000.00 invested capital) ..	4,000.00
Balance subject to tax @ 35% .....	\$ 6,000.00
Tax on \$6,000.00 @ 35% .....	\$2,100.00

To sum up the various income taxes assessed against a corporation, having an invested capital of \$50,000.00, and a declared value (for capital stock tax purposes) we have:

Net Income .....	\$10,000.00
Normal Tax: \$ 5,000.00 @ 15% .....	\$750.00
5,000.00 @ 17% .....	850.00
	1,600.00
Surtax: 10,000.00 @ 6% .....	600.00
Declared Value Excess Profits Tax:	
\$10,000.00 Income	
5,000.00 Exemption	
\$ 5,000.00 Subject to Tax	
2,500.00 taxable	
@ 6.6% .....	\$165.00
2,500.00 taxable	
@ 13.2% ....	330.00
	495.00

Excess Profits Tax:	
\$10,000.00 Income	
4,000.00 exemption 8% on \$50,000.00	
\$ 6,000.00 subject to tax @ 35%	2,100.00

**TOTAL TAX ON \$10,000.00 income (Average of 47.95%) .....** \$ 4,795.00

As will be seen from the above detailed tax computation, the corporation is actually paying 71.2% on the last \$2,500.00 of income as follows:

Normal Tax .....	\$ 5,000.00 taxed at 17.0%
Surtax .....	10,000.00 taxed at 6.0%
Declared Value Excess Profits.	2,500.00 taxed at 13.2%
Excess Profits .....	6,000.00 taxed at 35.0%
	71.2%

This is real taxation.

We have not discussed many old style taxes, both those of the Social Security group and those in the excise tax group. There is also the Wage and Hour law which, while not imposing a tax on employers, might result in a real source of trouble. Employers should satisfy themselves as to their exemption from this Wages and Hours Law; otherwise they may find they are indebted to their employes in a substantial sum. This is a dangerous situation for an employer to ignore.

We caution employers who have been under the State Unemployment Compensation Act, but have now decreased their employe count to such a point that they can file written request to be taken off the list. Such request **MUST BE FILED IN JANUARY** to be effective.



## Ventilation of a Trichlorethylene Degreaser

(Continued from page 170)

Fig. 10 shows a set of contours and streamlines for the horizontal slot. The velocity contours were substantially the same for the four types of exhaust openings at 6 inches or more from the face of the openings and at the same ventilation rates (c.f.m. per foot of tank perimeter). Streamlines indicated that the vertical slot type drew the smallest proportion of air from the space directly above the degreaser, probably because of its position at the outer edge of the tank.

When air currents directly over the tank from the level of 6 inches below to 16 inches above the edge were 30 to 35 f.p.m. (the usual range), the upward convection current velocities at the outer edge of the tank caused by heat dissipated by the degreaser were 50 to 75 f.p.m. At no time during the operation of the degreaser either with or without ventilation were air currents observed to "roll over" the edge of the tank and fall toward the floor, so far as could be determined by smoke tests.

Frequently the statement is made that ventilation of trichlorethylene degreasers should be accomplished at the edge of the tank because trichlorethylene vapors are heavier than air and naturally fall to the floor. However, since the momentary trichlorethylene concentrations above the edge of the tank probably do not exceed 1%

or 10,000 p.p.m. under the most unfavorable operating conditions, and since this concentration would have little effect on the resultant specific gravity of the air-vapor mixture, aerodynamically the mixture would behave practically the same as pure air at the same temperature. Furthermore, updrafts around the tank work directly against any theoretical tendency of vapors to fall over the edge. Finally, the marked inferiority of the vertical slot type of ventilation in the reduction of solvent exposure as compared with the other three types studied seems to indicate that gravity is of little or no assistance in capturing the warm mixture of air and trichlorethylene vapor. Nevertheless, ventilation should be applied at the perimeter of the tank for another reason. In that position it will not draw vapors across the operator's breathing zone, as would be the case with overhead or "updraft" ventilation.

### Summary

1. Four types of local exhaust systems for a large open type degreaser were studied to determine their effectiveness in controlling trichlorethylene exposures. Air samples were collected in the operator's breathing zone and solvent losses were observed at different ventilating rates.
2. Of the four ventilating systems used in this study, the horizontal slot type proved most efficient in reducing solvent exposures, from the standpoint of power requirement.

## Elgo Ventilating Specialties

### All-Steel Automatic Shutter!

#### A Sensational Improvement Over Aluminum

The steel louvers, while heavier than aluminum, operate with actually less resistance to the fan or blower than aluminum louvers. This is because of a patented spring mechanism which regulates the louvers so that they open easier and wider,

and also close faster and tighter when the air current ceases. No flapping or flutter.

Unlike other types of shutters, its tension is adjustable for different air velocities, making it adaptable to a great variety of conditions.

### All-Steel Motorized Shutter

Used for exhaust ventilation in industrial, commercial and residential buildings. Automatically controlled by fan switch. Six-second opening. Positive closing. Storm-proof. All-steel construction.



Elgo Shutters Are Distributed Through Fan and Air Conditioning Equipment Manufacturers



"ACME" TYPE AUTOMATIC SHUTTER Rear View (Closed)

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Elgo Shutter & Mfg. Co.  
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Automatic Shutters	Ceiling Dampers
Stationary Shutters	Balanced Vent Units
Hand Operated Shutters	Motorized Shutters

Name .....  
Address .....  
City ..... State .....

3. Vertical slot ventilation caused the lowest solvent loss increase but was least efficient in reducing solvent exposures.

4. The round hole system caused the highest solvent loss increase and required approximately twice as much power as the horizontal slot type to reduce solvent exposures to 100 p.p.m.

5. The elongated hole system failed to reduce solvent exposures sufficiently at the boiling chamber end of the tank, probably because of poor air exhaust distribution. Otherwise, its performance was similar to that of the round hole system.

6. The maximum solvent loss increase due to ventilation during continuous use of this degreaser was 2 gallons per 9-hour day or 1.2 gallons per square foot of tank area per 100 hours' operation. No significant relation between ventilation rate and solvent loss was observed.

7. At no time were trichlorethylene vapors found to "roll over" the edge of the degreaser during operation, either with or without ventilation.

8. A ventilation rate of 615 c.f.m. around the 20-foot perimeter of the tank using the horizontal slot or round hole system reduced the average trichlorethylene concentrations in the operator's breathing zone from a maximum of 400 p.p.m. without ventilation to below 100 p.p.m. The vertical slot system required a ventilation rate of 1400 c.f.m. to accomplish the same result.

Acknowledgment is made to the Detroit Rex Products Company for its assistance and cour-

tesies and for the use of photographs appearing in this report, and to Melvin W. First of the Bureau of Industrial Hygiene for his assistance.

## Income and Expense For the Minneapolis Code

(Continued from page 181)

largest expense in salaries. Included are salary for the Senior Heating Engineer, steam and hot water inspectors, warm air heating and air conditioning inspectors, a gas burner inspector, an oil burner inspector and a smoke and stoker inspector. Auto maintenance, of course, is for car operation by these inspectors.

The overhead salaries include prorated time of the Chief Building Inspector and clerical hire for the department. Supplies include printing, stationary, testing instruments, etc.

The department has never tried to show a large profit. Rather, its aim is to furnish service in keeping with the need so long as this service does not exceed department income. By judicious management, the department has always shown a small profit, as indicated in Schedule 1.

Direct answer to the questions, therefore, is—Minneapolis Building Department has consistently given a service which draws no complaint; the department is self supporting.

# WISS Famous Since 1848 . . . .

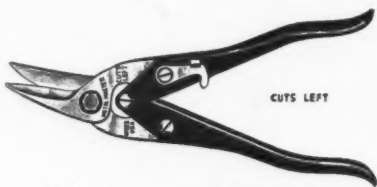
## BEST BY TEST

In sheet metal working shops the nation over, the name "WISS" is synonymous with fast cutting, high quality snips—snips that are as famous today as they were in 1848.

For 94 years, WISS SNIPS have won recognition for quality performance and maximum value—for strength and long life in hard service—for outstanding ability to meet everything demanded of them.



BULLDOG SNIPS  
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Aviation Pattern



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EVERY  
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COMPLETE LINE OF  
TINNERS SNIPS

J. WISS & SONS CO.  
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The Complete Quality Line

# SNIPS



## Short, Short Design Method

(Continued from page 144)

ter than misusing a more complicated system and there is less chance of error than there is where more mathematical computations are made. Even with the most exact system prevalent, a great deal is left up to the designer's judgment. Exposures, wind velocities and tightness of construction are all factors that depend on his judgment. In actual practice there can be from 10 to 25% difference in results obtained by two competent engineers on the same job where each has followed standard practices, due only to variance in opinions and judgment. Knowing this, we sometimes question the desirability of splitting hairs too finely. Also, there is no question but that standardizing is necessary and this article is as much a recognition of that fact as it is a method of figuring. What is more important, it has worked out in actual practice as well as in theoretical comparison with jobs figured by the Technical Code.

### What About Register Temperature?

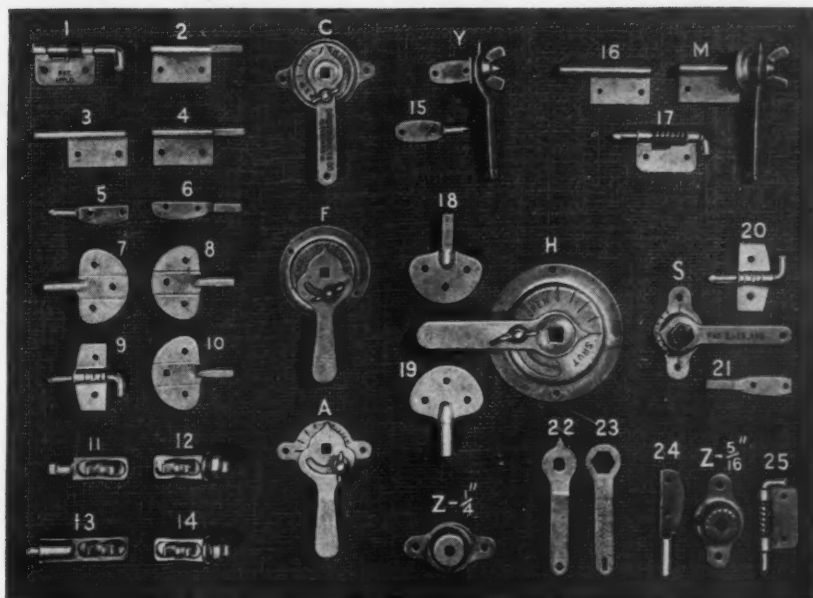
There may be some question regarding different register temperatures for the various rooms. The reason this has been ignored is that after the temperature corrections, which are not great in a house this size, have been made, it is still neces-

sary to use standard fittings that bring us right back where we started from. Naturally all branches must be dampered so adjustments can be made, but this must be done on any job, no matter how closely it has been worked out. In the case of second floor rooms, the gravity action during off periods of the blower more than make up for any difference in register temperatures.

There is one point the writer wishes to bring out—small jobs seldom operate at a static pressure of less than .25 inch, regardless of the theoretical loss. Sometimes they run way over this and .50 inch is not unusual. This is one reason why no outlets are figured for capacities less than 6000 BTU and no duct size figures are given for less than 75 CFM. It has been the writer's experience that small leads often cause the other branches to be dampered way down to get sufficient heat from the smallest branch, thus building up the static pressure. This is particularly true of bathroom runs, where the problem is to heat the room up fast in the morning from a cool start, rather than maintaining temperature through the day.

A warm air system is very flexible and many scoffers at proper methods of designing have been beneficiaries of this fact. If a system does not get the proper air delivery the register temperatures automatically tend to rise to overcome this.

## **APEX YANKEE MIDGET SIMPLEX NO-RIVET Lock-Tite Damper Regulators**



These quality-made damper regulators are for use in air conditioning ducts to balance the system. They are placed in all take-offs on main trunk lines and once set they stay set. They are available in many types and sizes . . . have rust-proofed finish and are priced right. To order, simply pick out the regulator by letter and the bearing sets by number. All sets are

packed one set in envelope and include rivets and screws.

### APEX DUPLEX SLAM PUNCH

This OHIO product is a great help on air conditioning work. With one crack of the mallet, it perforates two holes in the damper exactly where you want them.

Full Information and Descriptive Literature Can Be Had from Your Jobber, or Write Us Direct.

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A job figured for 135 degrees may actually operate at 175 degrees, in order to maintain comfort conditions. Also, CFM charts and blowers are usually based on 70 degrees air, which is considerable of a safety factor. However, there are often obstacles arising on jobs that tend to overcome these safety factors.

There is no question that a Technical Code job is figured out about as well as any can be, and the Technical Code is applicable to jobs which are way beyond the limits of the method given here. The designer will have to exercise his judgment in determining where this short method can be used and where it cannot. For the purpose for which it is intended—the small standard type of house, this short method will do the job and save a lot of figuring. Any suggestions, criticisms, or additions to it will be welcome.

### To Complete Privately Financed Dwellings

Civilian Supply Director Henderson announced on December 11 a plan to make materials available for the completion of privately financed dwellings for which foundations were in place on October 9. Preference Rating P-71, covering private dwelling units which can not qualify for assistance under defense housing plan (Preference Order P-55) will soon be available.

A statement of procedure to be followed in applying for assistance is available—"Procedure for Obtaining Preference Rating for Private Housing Under Construction on October 9, 1941 (Not Qualifying under Preference Rating Order P-55)" PM 1927.

## Privately Financed Home Building Volume

(Continued from page 180)

conditions. Under the present and prospective supply situation in the metals field, these requirements undoubtedly will result in curtailed construction in non-defense areas as well as in curtailment of construction of higher priced homes within defense areas.

At the same time, such widespread progress has been made during recent years in encouraging home construction in the lower price ranges that a large proportion of the private building undertaken since the start of the defense program has been well within the maximum price limitations established under the defense housing priorities system. Moreover, from a location standpoint, the defense regions designated as Defense Housing Critical Areas have been the most active points for private residential building, in response to the housing needs generated by defense industries.

### FHA Spurs Low-Cost Building

One of the long-term objectives of the FHA program has been to encourage increased home-building activity in the lower price ranges which previously were not considered a feasible market for a large volume of construction.

In 1940, approximately 75 per cent of the new homes financed by FHA-insured loans were



# Gar Wood

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**← OIL-FIRED**  
The Gar Wood Tempered-Aire models are the latest editions of a long line of units distinguished for their phenomenal fuel economy.

**STEAM • HOT WATER**  
Boiler-Burner Units are internally fired, downdraft type. Offered in five capacities.



**GAS-FIRED**  
Nine models, both vertical and horizontal types, comprise the new line of Gas-Fired units.





Today's highly satisfactory performance of Gar Wood automatic home heating and air conditioning equipment is the result of accumulated engineering and practical field experience of many thousands of installations throughout the country.

Write **TODAY** for this valuable **72-PAGE BOOK** on the Engineering, Installation and Operation of Heating and Air Conditioning Systems. **SENT FREE ON REQUEST** to Sheet Metal Contractors and Dealers, Engineers, Architects and Salesmen. This offer made for a limited time only.

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valued at less than \$6,000, including land and all utilities. During 1941, that proportion has materially increased as a result of the substantial additional amount of low-cost home building stimulated by the new Title VI—Defense Housing Insurance amendment to the National Housing Act. The maximum mortgage on a single-family dwelling which may be insured under Title VI is \$4,000. In the neighborhood of 75 per cent of all new home construction now being financed by FHA-insured mortgages under all phases of the program is located in the defense areas designated for Title VI operations, which in turn are largely identical with the Defense Housing Critical Areas.

Table 1 lists the number of new homes started under FHA inspection between March 31 and October 31, 1941, in the 50 Title VI areas which have shown the largest volume of activity under all phases of the FHA program.

Some early indication of the effect of the materials and priorities situation on new home activity under the FHA program, both inside and outside defense areas, is given by the recent trend of new-home mortgage insurance applications. During the first 8 months of the year, the total number of such applications selected for appraisal by the FHA was 202,599, an increase of 36.9 per cent over the like period of 1940. The 1941 figures include applications filed under Title VI, which

became effective from an operating standpoint on April 12.

In September, the combined volume of new-home applications was 21,232, compared with 20,035 in September 1940, an increase of only 6 per cent. In October, the total was 18,930, against 19,949 in October 1940, a decrease of 5.1 per cent.

As would be expected, the decline in applications has been concentrated in new-home mortgages to be insured under Title II, since activities under that title are conducted in all sections of the country. In September 17,168 small-home mortgage insurance applications were filed under Title II, a decline of 14.3 per cent from 1940 levels. In October, the volume filed under Title II was 14,652, a decrease of 26.6 per cent from October 1940.

#### Title VI Applications Increase

On the other hand, mortgage insurance applications filed under Title VI, which are limited to designated defense areas and to amounts suitable only for homes selling for less than \$6,000, increased to 4,278 in October from 4,064 in September. By October 31, 38,616 mortgages amounting to \$141,980,457 had been selected for appraisal under Title VI and 30,813 in amount of \$109,825,090 had been accepted for insurance. The maximum amount of mortgage insurance authorized by Congress under Title VI is \$300,000,000.

# Die Made Furnace Heads



## STOCK TOOLS FOR FURNACE HEADS

18" - 20" - 22" - 24" - 26" - 27" - 28" - 29" - 30" - 32" - 34" - 35" and 36"

## MEDIUM AND HEAVY PRESSED STEEL STAMPINGS

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## ACKERMANN MANUFACTURING COMPANY

WHEELING, W. VA.

### REPRESENTATIVES

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712 BOOK TOWER  
DETROIT, MICH.

HOOPER BYRNE CO.  
39 CORTLANDT STREET  
NEW YORK, N. Y.

D. R. LINDLEY  
229 EAST SOUTH ST.  
INDIANAPOLIS, IND.

## Fewer, But Better Finishes

(Continued from page 174)

to the materials of all suppliers, our results are comparable and, we feel, fair to our suppliers.

In addition to the tests themselves, we also had the problem of obtaining test data without bringing in the matter of suppliers' identity.

For this reason, in our standard practice, the Standardizing Division makes all tests.

We receive the sample and first assign a code number. The code consists of

- the month — (1 or 2 digits)
- the day — (1 or 2 digits)
- the year — (2 digits)

Assume that a requested sample of RCA #702 reaches us on July 16, 1940. The vendor's name is recorded by us and all identifying marks are then removed from the sample and the code applied. At this point the code would read:

RCA #702 — 71640

Each succeeding sample would add a digit. For example, the second specimen of a specific type or any other material received on the same day would read:

RCA #702 — 716401

If the material fails in our Laboratory tests, a report is issued to the Purchasing Department and further relations with the vendor are in their hands. Failure on a test does not bar a vendor, although, obviously, we will not continue making

tests indefinitely. As a matter of general practice, a failure usually results in a visit from the supplier and a discussion of the reasons for the failure.

If the test we make indicates approval, the balance of the quart sample, identified by RCA finish and code numbers, is sent to the factory for a production test.

If the factory results are good, we then order a 5-gallon lot and run the material through production to check our results. The production results finally govern. An approval on a laboratory basis is not sufficient. Unless the production test confirms the laboratory result, approval is not given. The material is then approved and an approval record is made. One copy is supplied to each Purchasing Department of our various manufacturing plants, and one copy remains in the files of the Standardizing Division.

This procedure continues until we have at least two approved sources of supply, and usually three to five. When we first set up this test procedure we found ourselves making an excessive number of tests. We now limit the number of samples on which we run tests to the scope of the job.

If consumption is very small, we stop testing when two suppliers are approved. If probable consumption is large, we establish at least three suppliers and usually more.

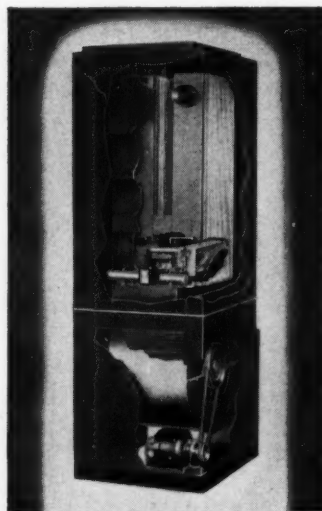
This method has been good both for us and for the suppliers. The number of samples decreased

★ LOCATIONS OF RACE FORCED AIR INSTALLATIONS



**Race**  
**FORCED AIR**  
**FURNACES**

DEFENDING THE COMFORT  
OF AMERICA'S SOLDIERS  
AND DEFENSE WORKERS



RACE units were selected for this all important job because of their dependability, performance and lasting quality.

To be assured of the best in forced air heating equipment USE and SPECIFY RACE.

Write for catalog, prices, etc.



**ROYAL AIR CONDITIONING EQUIPMENT CO.**  
1024 WESTMINSTER AVENUE  
ALHAMBRA, CALIFORNIA



considerably and suppliers found they were not wasting their time and ours on samples which had no real business volume.

#### Standardizing Thinners

In our work on finishes we found that most materials seemed to have a matching element known as "thinner".

As we reached the point where the identity of the manufacturer was no longer a major factor in the successful use of basic paint materials, we found that "thinner" was a real problem. At one time we had eight different kinds. We now have two.

One of the factors in our solution of this problem was the cooperation of the vendors.

Under our present system we give the supplier a sample of our "Standard Thinner" and ask "will your material work satisfactorily with this thinner?"

Our Standardizing Notices give processes which are always subject to revision as circumstances warrant. In the case of finishes, however, we also indicate the probable coverage to be expected per gallon of material. This is an arbitrary figure which remains constant and comparable because the measuring stick is always the same. Improvements in the technique and in establishing the records have now reached the point where the Standardizing Notice is a guide for ordering and stocking materials.

We do not feel that ours is necessarily the best system. In many respects our methods of test and approval are subject to scientific criticism, but the procedure has worked for us.

We have fewer finishes but better finishes.

We haven't fallen behind the progress in the art.

We have less obsolete material. Our inventory of finish materials is not a problem. We rarely have a "dead loss" and have only a small percentage to "use up" during the year.

We have a definite place of record to go to if we encounter troubles and usually locate the trouble quicker by going to the Standardizing Notice and reproducing the work on a controlled and known step-by-step process.

Our baking ovens are now set to one temperature because we request all "baked" type materials to be formulated to work with the temperature best controlled in our equipment. New "baked" type materials are considered with regard to our facilities.

In our company, our people all speak of Finish # ——— and we rarely hear about "some more of that light blue with the peculiar wrinkle formation."

We avoid complex routines and strive for simplicity of procedure. The system described has worked well for us and it is on that basis that we feel free to commend it to the consideration of others who have similar problems.

# THE R&G

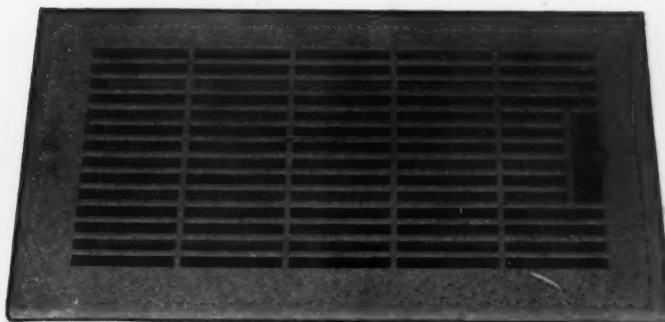


# TAKES A BOW!



**IN USE LESS THAN A YEAR!  
ALREADY FAMOUS FOR  
ITS LOW-COST AND SPACE-  
SAVING FEATURES!**

*R&G THIN MAN  
REGISTERS assure  
perfect performance  
in limited wall  
spaces. All moving  
parts rotate on es-  
pecially designed  
bearings; rust and  
clogging minimized!*



No. 1108, one of our most popular "THIN MAN" Registers is widely used in many Defense Housing Projects . . . R&G offers thousands of sizes and designs for all requirements; write today for our complete catalogue.

**REGISTER & GRILLE MFG. CO., INC.**  
**70 BERRY STREET** **BROOKLYN, NEW YORK**

## Manufacturing A Service Station Cabinet

(Continued from page 150)

ment of the folding door, housed in Sub-assembly 4, which is anchored, in final assembly, to the two main cabinets, by a minimum of sheet metal screws inserted from the rear of the assembly. The details show also the two rear cover plates which are fastened, by sheet metal screws, as shown, after sub-assembly 4 has been anchored to the two main cabinets.

Sub-assembly 4 consists of a frame-like construction of about four feet in length and 18 inches in width, inside of which is mounted the disappearing door moving on a rolling device illustrated in View K (Fig. 6), contained within the frame. This frame, as shown in View L, (Fig. 6), is fashioned ornamentally to present, in its exterior, an elevated and suitable "crown" to the two finials of the cabinets. In its frontal part it has provisions for a glass sign, which may be exchanged at will and behind it are provisions for either light bulbs or a fluorescent tube, the arrangement governed by the price the customer is willing to pay.

View 5, (Fig. 5), shows the tool hanger board fastened, from the inside of the tool compartment, to the two cabinets, and, also, the four sheet metal screws by which Sub-assembly 4 is fastened to the finials of the two cabinets. The view

shows, also, the arrangement by which the folding door may be locked in position above the bench when no work is being done on it.

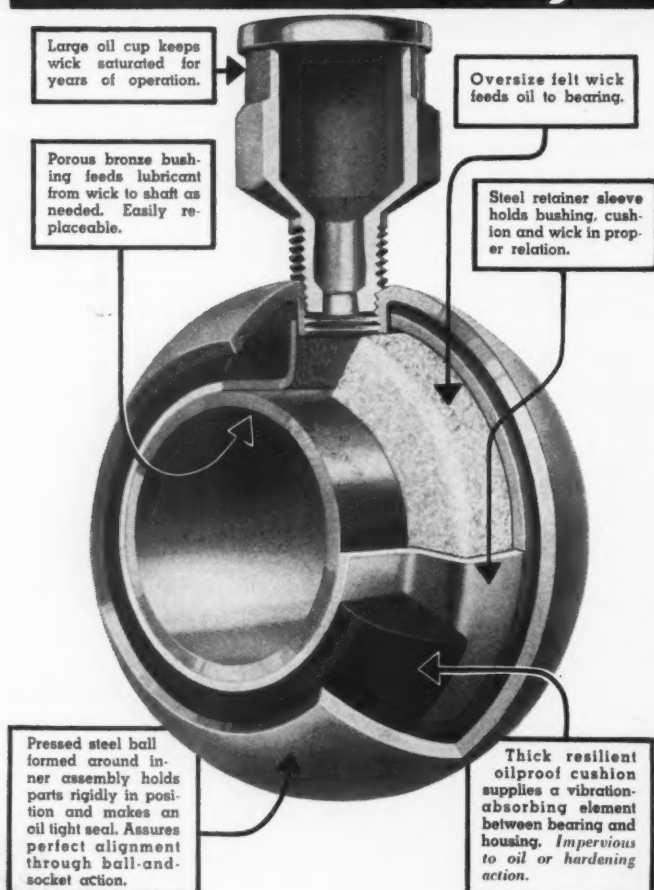
View 6 is a cross cut on a horizontal plane through the assembled unit.

In the planning of this or similar "decorative purpose" equipment, each small and insignificant piece of sheet metal must be carefully calculated and layed out for production. Each notch, slit, slot, hole, opening or joining edge must be pre-calculated and accurately placed and each machine operation must be done to prepared specifications.

If the above is strictly adhered to and if the supervision is adequate to insist on the workers at the machines doing the work correctly, the labor cost of building the above unit, enameling included, just about equals the cost of the materials, so that the cost of producing the merchandiser in one hundred or more units at a time, is not prohibitive.

The manufacture of this unit and like equipment is accomplished by common sheet metal machinery—shear, brake, roller, notching and punching press, spotwelder and arc or acetylene welder, supplemented by abrasive finishing apparatus and spray-painting, heat-treating equipment. It will be noticed from the number of views given here that the machine operations are simple, the spherical corner formation being the most difficult.

## No Other Bearing In Air Conditioning



has all these

## QUALITY FEATURES

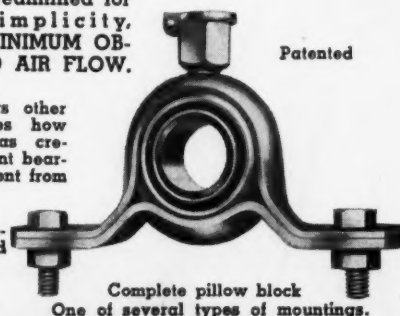
The Triangle Shock-Absorbing Pillow Block is a trouble-free bearing for fans, blowers and other devices requiring silent operation—perfect alignment—and self-lubrication.

1. It is the only bearing for air conditioning that has a resilient oil-proof cushion scientifically built into the bearing—for silence and vibration absorption.
2. Ball-and-socket design for perfect alignment.
3. Scientifically streamlined for compactness, simplicity, strength and MINIMUM OBSTRUCTION TO AIR FLOW.

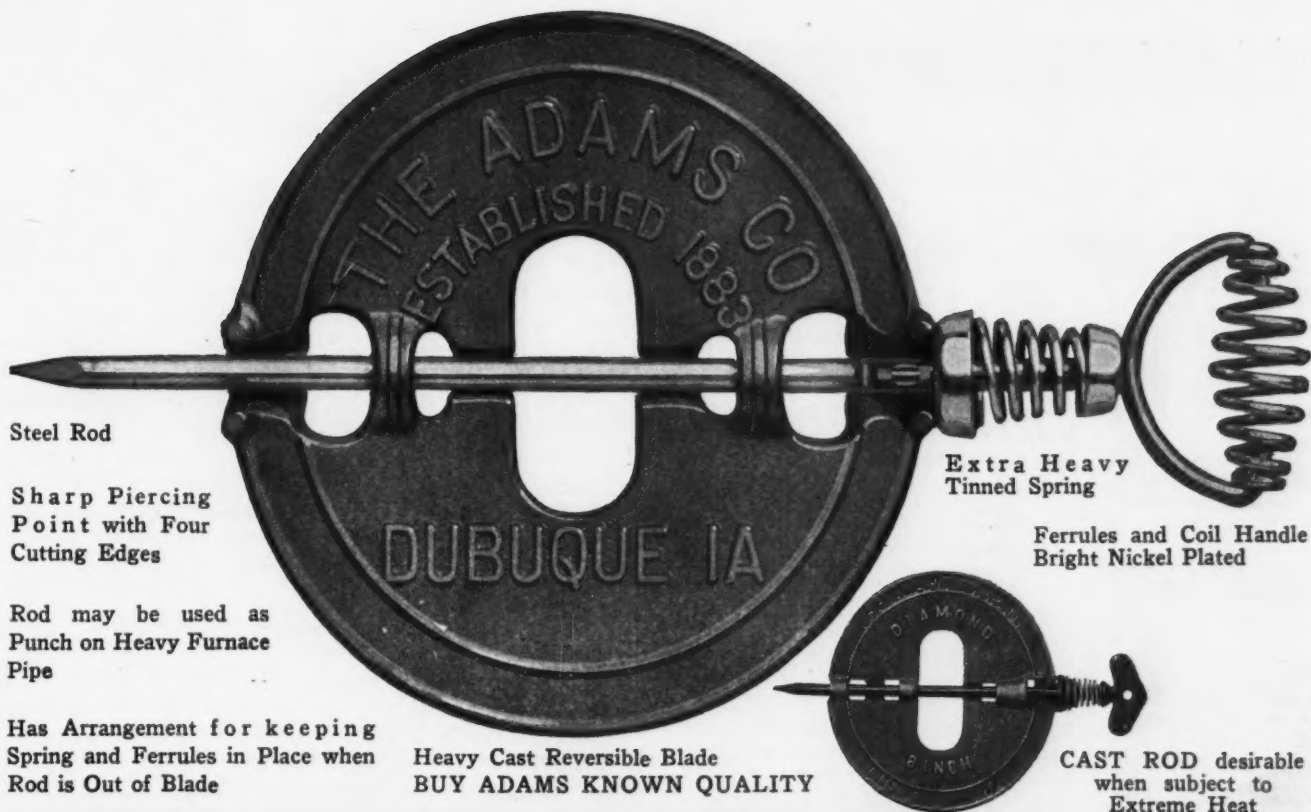
Cut-away view shows other features and illustrates how unique engineering has created a new type of silent bearing outstandingly different from the conventional.

Triangle design assures high efficiency and low cost operation.

Write for quotations.



**TRIANGLE MANUFACTURING CO.**  
392 DIVISION STREET OSHKOSH, WISCONSIN



Steel Rod

Sharp Piercing Point with Four Cutting Edges

Rod may be used as Punch on Heavy Furnace Pipe

Has Arrangement for keeping Spring and Ferrules in Place when Rod is Out of Blade

Heavy Cast Reversible Blade  
BUY ADAMS KNOWN QUALITY

Extra Heavy Tinned Spring

Ferrules and Coil Handle Bright Nickel Plated

CAST ROD desirable when subject to Extreme Heat

## DIAMOND SMOKE PIPE DAMPER

Manufactured by **THE ADAMS COMPANY** Dubuque, Iowa, U.S.A.  
ESTABLISHED 1883



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*"They Also SERVE"*

**ONLY CONCO HAS THE "FUEL MISER"**

For Homes Five to Twelve Rooms

*Featuring:*

**FLAMING FORGE BURNER**  
A tough, massive, high alloy, self-cleaning burner. Heavily built. Won't clog or burn out.

**CONCO'S EXCLUSIVE FUEL MISER**  
Cuts fuel costs up to 1/3! Fully tested: trouble-free. Maintains even fire-bed: prevents overcoasting of thermostat.

**CONCO'S SUMMER SALES PLAN FOR DEALERS**

**Write for It Today**

Turn summer-time to profit-time with Conco's Summer Sales Plan. This attractive manual tells you how.

**CONCO CORPORATION**  
COAL OIL AND GAS HEAT • MENDOTA, ILLINOIS

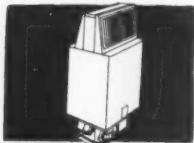




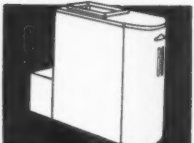
# 6 OIL FURNACES FOR DEFENSE HOME HEATING



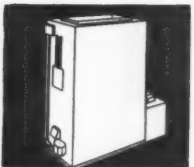
STANDARD REGISTER  
FLOOR FURNACES



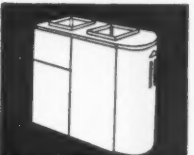
DUAL WALL REGISTER  
FLOOR FURNACES



AUTOMATIC "COTTAGE"



MANUAL "COTTAGE"



SIZE A, TYPE AC



SIZE B, TYPE AC

## AN OUTSTANDING UNIT

Eight times out of ten, you can solve one of your biggest problems—which is to provide modern oil heat at low installed cost in defense homes—by using H. C. Little oil-burning Floor Furnaces. C. Edgar Wood, sales agent for 112 small homes at Dundalk, Md., says: "We feel that the (H. C. Little Oil Floor Furnace) is the best heating unit for small homes on the market today... we do not hesitate to recommend your unit to anyone who is interested in heating a small home."

The H. C. Little Oil Floor Furnace now has a record of thousands of successful installations. Here's why: Low first cost. Low-cost installation...compact, factory assembled...saves metal, no ducts...no basement needed. Low upkeep...burns cheap No. 3 furnace oil...compact vaporizing burner, no moving parts. Listed by Underwriters' Laboratories. Manual control or full Automatic operation, electric ignition and Thermostatic control. Single floor register or dual wall register models available. 46,000 BTU or 68,000 BTU output, either model.

## OTHER SMALL-HOME FURNACES

Also designed exclusively for small homes are the other oil furnaces shown. Warm air, basement type, they feature low installed cost and money-saving operation. There are many sizes and models...50,000 BTU to 125,000 BTU output...manual and automatic control...a style for every need.

## MONEY-SAVING BURNER

All units are equipped with the trouble-free H. C. Little Burner...the only vaporizing burner with full automatic operation and electric ignition. Listed by the Underwriters' Laboratories...burns No. 3 oil...no moving parts to wear out...no pilot light to cause soot or carbon. Also available with Manual Control.

ALL UNITS LISTED BY UNDERWRITERS' LABORATORIES

**H. C. LITTLE Burner Co.**  
HOME OFFICE: SAN RAFAEL, CALIF.

WAREHOUSE STOCKS and Direct Factory Representatives in Boston, Newark, Baltimore, St. Petersburg, Aurora, Ill., Des Moines, Seattle, Portland, Ore.

**SEND FOR FREE BOOKLET!**

**H. C. LITTLE BURNER CO.**  
San Rafael, California

Please send me free, "Six Low-Cost Oil Furnaces for Defense Homes."

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

## Kruckman's Washington Letter

(Continued from page 95)

of their excess earnings in defense housing. The idea parallels other forced savings plans in order to absorb surplus. All these forced savings and forced investment plans will probably have the saving grace of guarantees by the Government for the savings and the investment. Otherwise those who are forced into housing, might find themselves with worthless investments on their hands at the unknown end of the emergency. Be prepared for some weird and strange finance plans before the War is won. It may even happen that the industrialist may be forced involuntarily to accept securities as part payment for the work he does. Regulations already are in force making it legal to pay workers with savings stamps and Defense bonds for overtime.

## Government to Finance 150,000 Units

Government will finance the 150,000 dwellings it builds with funds provided chiefly under the terms of the Lanham Act. This law has already authorized \$600,000,000 worth of housing, the dwellings built or building. Another appropriation for another \$300,000,000 has been signed, since before Christmas but could not be touched because no one had remembered to provide anybody with authority to use it. That being the case, all projects waiting for the money to go ahead, simply had to wait until Congress straightened out the muddle. And since this seemed like a heaven sent opportunity to air some differences

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**STEP UP  
PRODUCTION!**  
**MARSHALLTOWN**  
**THROATLESS SHEARS**

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**THE *most*  
PROFITABLE  
TOOL IN  
THE SHOP**

Cut ANY shape—ANY size  
sheet!



No. 18  
Hand  
Power!

Here's just the Shear for your shop—it's a PROFITABLE, inexpensive, hand-operated tool. Does hundreds of odd shearing jobs better and faster.

Quickly CUTS ANY SHAPE in 18 gauge or lighter material.

Get special Shear Bulletin today. Gives details of sizes from 18 gauge to one-half inch capacity.

**MARSHALLTOWN MFG. COMPANY**  
920 E. Nevada Street Marshalltown, Iowa

about how and by whom the money is to be spent, the Appropriations Committees of the Senate and the House, and individual members of the Senate and the House, have been enjoying a glorious field day of indoor sports sniping at the housing program.

#### USHA Slum Clearance On the Griddle

The chief fight is over the USHA. USHA has never been popular out through the country. USHA has gone into the ash can districts scattering the largess of Uncle Sam. There have been fights with local real estate operators, and with local contractors. The people of the towns and cities have raised their voices loudly so that the noise could be heard by their Representatives and Senators in Washington. Whatever else may have happened to the people in Congress, they are still quite close to the folk back home. Thus they have learned that the social planners have put the USHA in very bad with the voters back home; and the members of Congress have made every effort to eliminate the USHA from the defense housing program.

The authorizing Act, as passed by the House, would prevent any defense housing from being conveyed to any agency engaged in slum clearance or in building subsidized housing for low-income groups, which obviously is aimed at USHA. All construction would be placed in charge of the Federal Works Administrator, and the actual work of building would be done by the Public Buildings Administration, or the Army and Navy. The patent object of the House bill is to place the building under the influence of the localities, and local contractors, as much as is possible in jobs, employment and tradition.

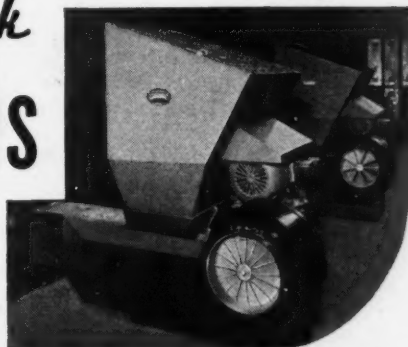
## a lot of REPUTATIONS WERE MADE ON THESE COMMERCIAL STOKERS!

... ours, and those of some thousands of engineers and commercial and industrial executives—to whose judgment the first-rate performance of FREDERICK Stokers has been a year-in-year-out tribute.

For heavy duty operation, the unusual mechanical simplicity of the FREDERICK Stoker has decided advantages—well demonstrated in 24 years' use—pertinent to your problem today. There's a size and type for practically any requirement. Ask about them; no obligation.

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INDUSTRIAL  
**STOKERS**

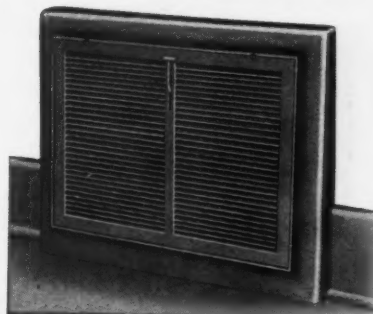
Product of the  
**Frederick Iron & Steel Co.**  
East Street, Frederick, Md.  
"Builders of Good Stokers for Over 24 Years"



**COMPLETE LINE OF CENTRIFUGAL PUMPS FOR ALL PURPOSES  
STEAM OPERATED ASH CONVEYING SYSTEMS • ASH STORAGE BINS**

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**NEW STYLES—NEW EFFICIENCY  
PROVEN QUALITY**



**NEW  
BENDA-  
VANE**

The new Benda-Vane register is neat, practical and adjustable to any angle. Just the thing for new or modernized installations.

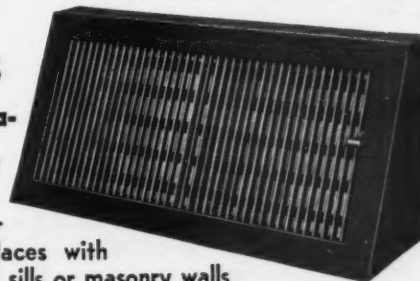
#### No. 822 Wall Register—Horizontal Vanes



Rock Island Air-Vane Registers are of bar type fabricated construction—Attractive Appearance—Rigid Construction—Vertical or Horizontal Vanes — Simple, secure adjustment.

#### OUT-O-WALL forced air REGISTERS and

**INTAKES  
With Benda-  
Vane Face**



Your answer for those places with double joists, sills or masonry walls where you cannot cut in the ordinary baseboard register. You save 90% of the labor and improve your job using OUT-O-WALL registers and intakes.

Mail Coupon Today

ROCK ISLAND REGISTER CO.  
Rock Island, Illinois

Gentlemen:

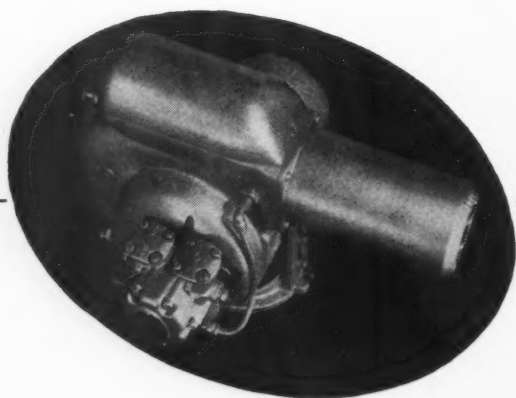
Please mail me a copy of your dealer's latest price book.

Name .....

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## Make a Date with a Profit!



**T**HERE'S a *protected* profit in every burner in Herco's four series. Make a date to see and learn for yourself! Write for complete information on these outstanding Hercos. Ask yourself, "Have I ever... anywhere... at any time... seen better engineered oil burners?" Herco Unit Engineering protects your profits by minimizing service calls. Herco Residentials are equipped with light-actuated Mercoid Visaflame—the *proved* safety control. Herco's exclusive, oil saving Thrifti-Fier protects customer good will by squeezing every last therm of heat from every last drop of oil. See the Hercos... and see for yourself!

**HERCO OIL BURNER CORPORATION  
LANCASTER, PENNA.**

All Herco Oil Burners are listed as approved by Underwriters' Laboratories, Inc., for Commercial Standard CS75-39.

**HERCO**  
*The Oil-Thrifty*  
**OIL BURNER**

The Senate, however, eliminated all declarations of policy aimed at the USHA, and eliminated the provision placing control over the work in the power of the FWA administrator, and deleted the requirement that the construction be done by PBA. Instead it placed all powers in the hands of the President. He may, under the Senate bill, place whom he pleases in charge, and designate any agency he pleases as the actual builder.

These conflicting versions went to conference between the House and Senate Committees. The Senate version without much doubt is the version which the whole Congress will obediently enact. Meanwhile, you can see how the winds blow by the priorities order recently issued by Donald Nelson, director of priorities and ruler of SPAB. It gives USHA a very high A rating for materials required to complete 7,042 low-cost dwelling units costing \$29,000,000 and involving the demolition of 3,225 condemned buildings.

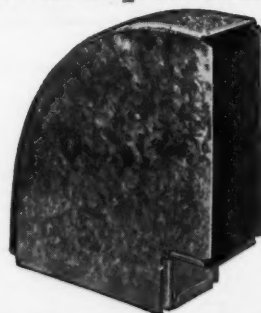
### Mass Buying Has Not Been Too Satisfactory

Hitherto, generally, public defense housing jobs have been advertised and have been let on contract to the bidders. There was a flurry of mass-buying of plumbing, heating and other household equipment. Over 33,000 furnaces were mass-bought for \$1,500,000, representing one-third of all defense housing erected to the end of 1941. Apparently it did not work out very successfully in the matter of coordination with the preponderance of normal contract jobs. Most of the later equipment supplies, such as furnaces, were procured by the contractor, and installed by the contractor. Now, however, laws requiring contracts have been suspended as a War measure, and the cost-plus-a-fixed-fee system has been ordered in the interest of speed.

# AJAX

**PREFABRICATED DUCTS—FITTINGS**  
for Forced Air and Air Conditioning Installations

24-hour  
Delivery  
Service



Our  
Engineers  
Are At Your  
Service



Our Catalog "A" (Gravity Fittings), Catalog "B" (Forced Air Fittings) are yours on request.

**THE CINCINNATI  
SHEET METAL & ROOFING CO.**

*Furnace Fitting Department*

230 E. Front St.

Cincinnati, Ohio



The system requires that the building agency supply materials and equipment. It is regarded as natural therefore that the Government will mass-buy furnaces, and that the Government general contractor, as its agent, either will employ the necessary labor to install the furnaces, or will make the necessary subcontracts with contractors to do the installation. Probably, the original contracts being a cost-plus-a-fixed-fee transaction on a 7% profit basis, the subcontract for installation will be negotiated on the same basis.

#### FWA's New Fixed-Fee Mass Buying

By the time this is published the Federal Works Agency may have announced its new mass-buying policy and explained its mass-buying machinery. The whole plan has been worked out by Don E. A. Cameron, the FWA mass-buying coordinator. As explained in these columns several months ago, Cameron has arranged a schedule of housing equipment, approximately 17 items, including furnaces, which will be bought in relatively vast numbers. Cameron will issue the specifications and the specifications will be transmitted to the Division of Procurement of the Treasury, and Cameron will certify to the Division of Procurement that the equipment and the volume will be required at certain specified times. Cameron will indicate the distribution and will certify the distribution among the projects according to the number of dwellings in each project.

The Division of Procurement will either ask for bids, or will arrange to procure the equipment on the basis of cost-plus-a-fixed-fee, 7% profit, from the manufacturers or wholesalers. It is not yet quite clear which plan will be most widely used. The guess is that the cost-plus a fixed-fee at 7% will be the prevailing system. Obviously all these purchases will

### Use **WALSH STOKER and OIL BURNER REFRACTORIES** for **MAXIMUM ECONOMY**

**WALSH MORT-AIRSET** (High Temperature Cement)

**WALSH PLASTIC FURNACE LINING** (Plastic Fire Brick)

**WALSH "Super" PLASTIC FURNACE LINING** (Plastic Fire Brick)

**WALSH HEARTH AND BAFFLE MIX** (Castable)

**WALSH TORID-CAST** (Refractory Concrete)

**WALSH Stove and Furnace Liners**

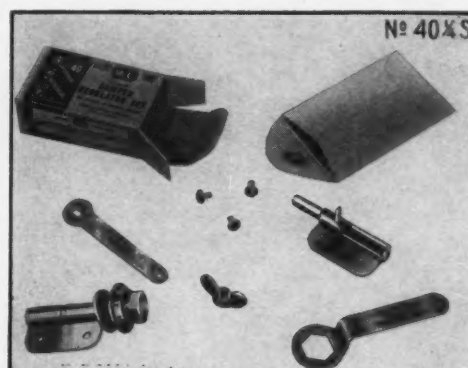
*A complete line of high grade fire brick and specialties for industrial and domestic stokers and oil burners.*

**Walsh Refractories Corporation**  
4070 North First St., St. Louis, Missouri

## H&C DAMPER REGULATOR SETS

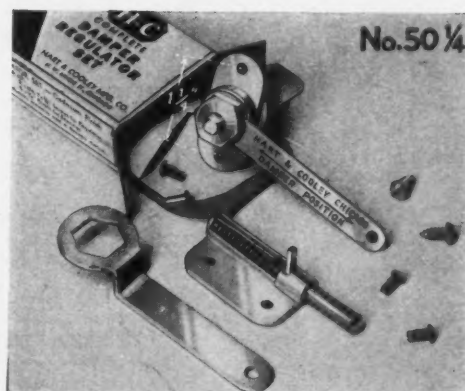
### Pick the Type that Suits You Best!

H&C offers three different sets in the  $\frac{1}{4}$ " size, all furnished with snap end bearing to permit the installation of even the smallest dampers without bending. All are quality sets in every detail with all parts rust-proofed; all are equally adaptable to splitter or regular dampers. See your Jobber or write for sample and descriptive literature.  $\frac{3}{8}$ " sets are available in class 50 $\frac{3}{8}$  and 80 $\frac{3}{8}$ . Immediate shipment from stock.



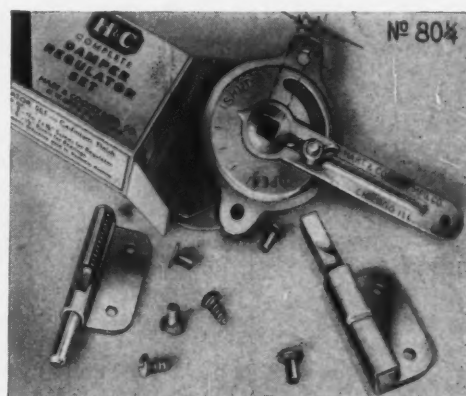
#### ECONOMY TYPE

Quality at a Price! Furnished with both wing and hexagonal lock nuts. Made only with  $\frac{1}{4}$ " Bearings. No. 40 $\frac{1}{2}$  S — List Price 30c Set.



#### BRACKET TYPE

With  $\frac{1}{4}$ " Bearings, No. 50 $\frac{1}{4}$  — List Price 40c Set. With  $\frac{3}{8}$ " Bearings, No. 50 $\frac{3}{8}$  — List Price 60c Set.  $\frac{1}{4}$ " size has snap end bearing.



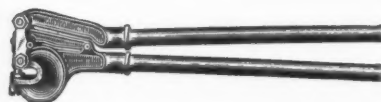
#### DISK TYPE

With  $\frac{1}{4}$ " Bearings, No. 80 $\frac{1}{4}$  — List Price 40c Set. With  $\frac{3}{8}$ " Bearings, No. 80 $\frac{3}{8}$  — List Price 60c Set.  $\frac{1}{4}$ " size has snap end bearing.

**HART & COOLEY MANUFACTURING CO.**

Holland, Michigan — Chicago Office at 61 W. Kinzie Street

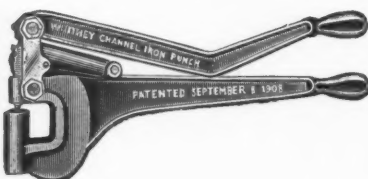
# ★ ★ Tools by W. A. WHITNEY



## NO. 1 HEAVY DUTY PUNCH

Length 34", weight 22 lbs., well distributed to balance the tool. Capacity  $\frac{1}{4}$ " hole through  $\frac{1}{2}$ " iron. Heavily reinforced for strains. Punches and dies  $\frac{1}{4}$ " to  $\frac{1}{2}$ " by  $\frac{1}{4}$ ". Insertable Pipe Handles.

**NO. 2 PUNCH**  
Length 23". Capacity  $\frac{1}{4}$ " through  $\frac{1}{2}$ " iron, weight 13 lbs., depth of throat 1 $\frac{1}{2}$ ". Punches and dies  $\frac{1}{4}$ " to  $\frac{1}{2}$ " by  $\frac{1}{4}$ ".



**CHANNEL IRON PUNCH**  
Every part is interchangeable with the No. 2. Length 23", weight 16 $\frac{1}{2}$  lbs. Depth of throat 1 $\frac{1}{2}$ ". Capacity  $\frac{1}{4}$ " through  $\frac{1}{2}$ " iron. Punches and dies  $\frac{1}{4}$ " to  $\frac{1}{2}$ " by  $\frac{1}{4}$ ".

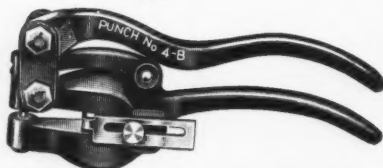
**NO. 3-B PUNCH**  
Capacity  $\frac{1}{4}$ " hole through  $\frac{1}{2}$ " iron. Length 18 $\frac{1}{2}$ ", weight 7 $\frac{1}{2}$  lbs. Depth of throat 2". Stock size of punch  $\frac{1}{4}$ " to  $\frac{1}{2}$ " by  $\frac{1}{4}$ ".



**NO. 6 FLANGE PUNCH**  
Punches within  $\frac{1}{4}$ " of inside corner of Angle Iron. Capacity  $\frac{1}{4}$ " through  $\frac{1}{2}$ " iron. Depth of throat 1 $\frac{1}{4}$ ". Throat opening width  $\frac{1}{2}$ " above die top. Punches and dies  $\frac{1}{4}$ " to  $\frac{1}{2}$ " by  $\frac{1}{4}$ ". Especially adapted for Button Punching. Weight —10 lbs.

**NO. 4-B ONE HAND PUNCH**

Length 8 $\frac{1}{2}$ ". Capacity  $\frac{1}{4}$ " through 16 gauge iron. Weight 3 lbs. Depth of throat 2". Punches and dies  $\frac{1}{4}$ " to  $\frac{1}{2}$ " by  $\frac{1}{4}$ ".



Look for this mark when buying!

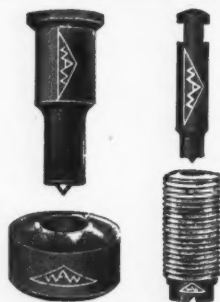
**CHANNEL IRON**  
2 $\frac{1}{2}$ " Flange x  $\frac{1}{4}$ " Web.

**ANGLE IRON**  
2 $\frac{1}{2}$ " x 2 $\frac{1}{2}$ " x  $\frac{1}{4}$ ".



**NO. 91 BENCH PUNCH**

Capacity  $\frac{1}{4}$ " hole through  $\frac{1}{2}$ " iron.  $\frac{3}{4}$ " hole through  $\frac{1}{2}$ " iron. Weight 82 lbs. Depth of throat 5". Stock size of punches and dies  $\frac{1}{4}$ " to  $\frac{1}{2}$ ".



**EXTRA PUNCHES AND DIES**

Prompt shipments can be made of any size or any quantity of both types of extra punches and dies as here shown.

WRITE FOR CATALOG

**W. A. WHITNEY MFG. CO.**  
636 RACE ST. ROCKFORD, ILL.

come under a high A priority rating, being for defense housing. This means, of course, that the manufacturers will be able to secure materials.

It is probable mass-buying will be practiced by all other Government building agencies. For example, Farm Security Administration, for its segment of defense housing, recently advertised for bids for 1,000 oil-fired furnaces. The furnaces are to be delivered in 25% lots on May 1st, June 1st, July 1st, and August 1st, 1942. The manufacturer was assured that he would be aided in production by a blanket priority rating of A-6, and would be given a PD-19d order form for his supplies. He was also put on notice that the contract might be increased to an additional 250 furnaces.

## Pig for Cast Furnaces Is Available

Division of Civilian Supply, OPM, says there is a supply of pig iron available for the manufacturers of cast iron furnaces, as there is pig iron available for all other manufacturers who use the material. Pig iron, in moderate quantities, seems to be available for all who wish to procure it. OPM's attitude is that there is no over-all restriction on pig iron, that it is available, and that the means and methods of securing a supply is solely the business of the manufacturer who needs it. Apparently the idea is to let the manufacturer and the supplier of pig iron fight out their own battles without much interference by the OPM. On the other hand, OPM very emphatically says there is a pronounced scarcity of heavy plate, 8 to 12 gage, available for the manufacture of steel furnaces. Nor will the body stock of automobiles be available for the manufacturer of rectangular casings.

The same situation markedly applies to the avail-

NOW MORE THAN EVER BEFORE  
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MEET DEFENSE HOUSING  
SPECIFICATIONS 100%—here's how!

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ability of galvanized iron for furnace casings and for duct work. And OPM says there is no black iron available to supersede galvanized iron for duct work. All the materials, except the pig iron, are tightly controlled and are desperately needed in direct War industries, and in the industries called defense work because they have an important indirect bearing on War preparations.

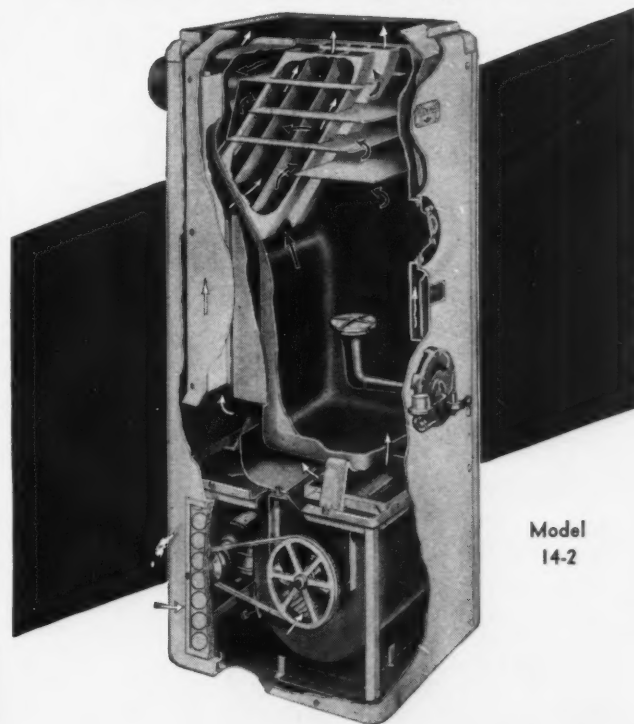
It is generally felt here that *non-defense* production of furnaces, stokers, stoves, ranges, and other heating and cooking equipment may have to be cut to as low as 30% of the norm, usually some period in 1939 or 1940 fixed as yardstick. Producers of *non-defense* stoves, ranges, and similar equipment have already cut production between 42% and 30%, the cut being made in proportion to the factory sales value over a certain period. Factories producing \$3,000,000 or more in a year, got the most drastic cut. Those selling \$1,000,000 or less were cut least.

#### Sheet Steel Products Under Scrutiny

On February 1st, no manufacturer of metal equipment will be permitted to use any metal for ornamentation. Nor will the manufacturer be permitted to shift in production between types without OPM permission. Manufacturers are expected to reduce the number of models they produce, concentrate on the most economical use of iron and steel and substitute, re-design, and re-specify wherever possible. The general trend in OPM planning may be deduced from the statement that factories, all, in general, in *non-defense production*, will be cut to 50% of 1939 levels, as rapidly as the machinery can be put in motion to effect the reduction.

It is hoped that what the OPM calls air conditioning

## Get More DEFENSE HOUSING CONTRACTS with the MOR-MAC Utility Model



Model  
14-2

If you are located in a defense area, you should get prices and specifications on the Mor-Mac Utility Model Tubular Winter Air Conditioner. It is your answer to the problem of maintaining your volume during the present difficult situation.

The Mor-Mac Model G14-2 is a complete, sturdy, attractively designed winter air conditioner for gas firing. It is designed for the small home and meets defense housing needs perfectly. Altho it incorporates all the important features and is exceptionally well built, the Utility Model is priced to fit into defense housing budgets.

We also manufacture a Utility Model known as O14-2 for oil firing. Both models are shipped completely assembled. All you do is set the burner and wire the controls. The Mor-Mac gas burner is a fixed orifice, twin port, venturi tubular design universal burner producing a semi-luminous, full floating, convex flame.

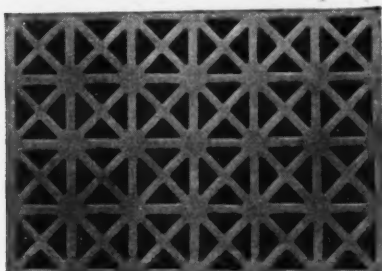
Note these specifications and features: Bonnet Output (Oil) 67,000 b.t.u., (Gas) 64,000 b.t.u.; Input (Oil) 0.6, (Gas) 80,000; Casing Width 22"; Casing Length 25"; Casing Height 58 3/4"; welded, heavy copper-bearing steel firebox; scientific air distribution; pre-assembled, attractively finished, die-stamped casing; over-size blower.

Except for a limited number of sample orders, the Mor-Mac Utility Model is available only on priority numbers. A defense housing contract is your assurance of prompt delivery.

Write or wire for prices, specifications and delivery date.

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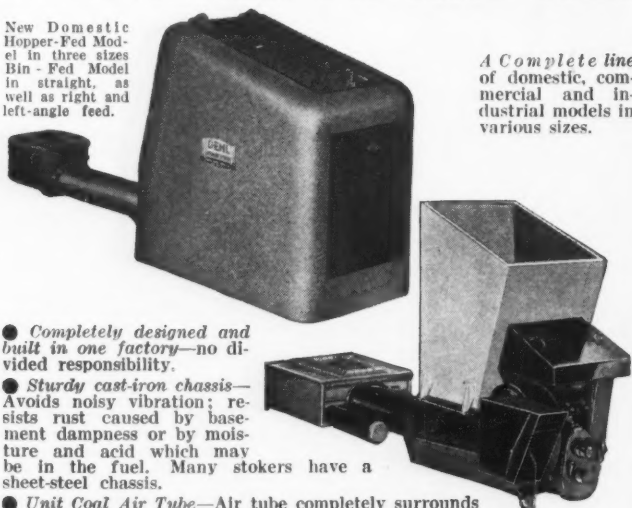
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The Better  
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STOKER**

Every year since its beginning, the Gehl Stoker has made new sales records year after year—last year an increase of 110 per cent. Still greater opportunities are ahead for 1942 . . . and Gehl is ready with an improved line, a continuation of our practical advertising program, sales helps, and easy financing plan.

## Engineered To Give Better Heat At Lower Cost For More Years

New Domestic Hopper-Fed Model in three sizes Bin - Fed Model in straight, as well as right and left-angle feed.



A Complete line of domestic, commercial and industrial models in various sizes.

- Completely designed and built in one factory—no divided responsibility.
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  - Unit Coal Air Tube—Air tube completely surrounds the coal feed tube. Air enters both sides of the retort, assuring uniform conditions over the entire fire bed at all times.
  - Gehl Air Governor—The greatest improvement ever put on a stoker. Once set, no further attention is necessary. In connection with draft balancer, it takes care of variations in fuel and weather—maintains fire at proper depth.
  - Auto-Type Transmission—Smooth continuous drive, with high-grade gears running in oil.
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  - Motor, rubber-mounted and equipped with safety overload protection.
  - Unconditionally guaranteed by a 74-year old Company.
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EST. 1867, DEPT. A, WEST BEND, WISCONSIN

and heating equipment plants, with a usable capacity of more than \$500,000,000 production, may rapidly be transformed to make fuel tanks, general sheet metal work for engines, cowlings, compressors, fuse cylinders, mine sinkers, castings, magneto parts, bomb components, searchlights, motor parts, smoke shells, aircraft sheet metal, fins, tail planes, rudders, radiators, boilers, smoke boxes, ammunition boxes, shell casings, cylinders, fuse containers, smoke floats.

### OPM Thinks We Have Great Surpluses

*Editor's Note.—The next few paragraphs in Mr. Kruckman's report are, perhaps, as startling as anything to come out of Washington in many weeks. If true, then the warm air heating industry has a real job on its hands—to prove that stocks are not great. AMERICAN ARTISAN's own survey in the field shows that jobbers' stocks are pitiful. True, many furnace dealers have been able to maintain reasonable furnace stocks, but what good are furnaces if we can't get sheets for pipe and ducts, or finished pipe work or are not able to get required sizes of furnaces?*

It may be news that OPM generally holds that manufacturers of furnaces, stokers, and similar products, especially products made of metals, have been making such vast reserves of finished units, that, despite drastic cuts, it will be several years before the ultimate consumer should really feel the pinch. OPM apparently believes the general run of manufacturer has crowded production to such an extent that he can go along for some time without denying his customer any essential inventories.

OPM also holds that the wholesaler, the jobber, the contractor and the retailer, particularly in the metals

USED BY COUNTRY'S LEADING GAS UTILITIES



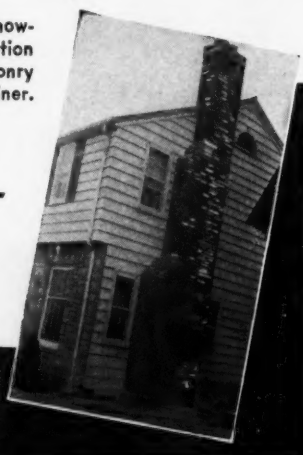
HEREMETAL Flue Liners have proved their superiority and are being used in more installations and conversion jobs because of the economical showing in fuel savings; the ease with which they are installed and the protection given to masonry and chimney.

A checkup of the chimneys in your neighborhood needing repairs will show you the profit you can make by installing HEREMETAL flue liners.

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fields, have stocked up so heavily that they can supply their customers for many months.

OPM even feels that the ultimate consumer, the householder, has been forehanded in many places and in many ways in getting equipment and appliances that have been cut down or entirely cut off the list. Moreover, OPM is of the fixed opinion that householders everywhere can continue to carry on for a long time with the equipment they already have; that repairs, replacements and maintenance, honestly practiced, will help to conserve the alleged vast manufactured stocks supposed to be stored in many warehouses and factories and stores and even in institutions and smaller establishments, down to the homes.

If you don't know it you should, that back in the minds of the all-highest in OPM is the thought that if there is a final ultimate urgency in War demands for metals, demands based on the needs of our Allies as well as on our own needs, these assumed vast stocks of fabricated, manufactured and otherwise completed metal products, may be demanded and requisitioned for reduction to the War purposes.

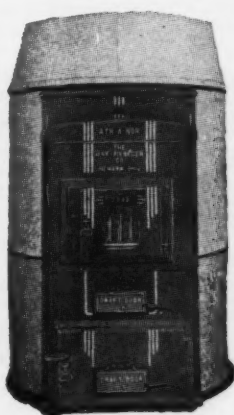
#### Repairs to Be a Patriotic Drive

For this reason it is obvious the Government will continue to drive for the adoption of its proposal that repairs, replacements, and maintenance is a paramount patriotic duty. The present apparent lag is attributed partly to irritation over the unavoidable Government red tape, but mainly because of the whole gamut of uncertainties that assail the average person. No one knows how long the War may last. The general public is told it may be over swiftly, within a year at the most. Others hear it may take five years. Still others feel it may last 10 years, 20 years, even 30 years, as

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Furnaces, like any other piece of merchandise, are only as good as the people who make them. The May-Fiebeger Company has been making the ATH-A-NOR Furnace illustrated for over fifty years, and the fact that it will perform with unusual efficiency and economy is backed up by hundreds of satisfactory installations.

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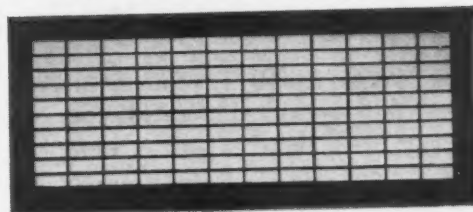
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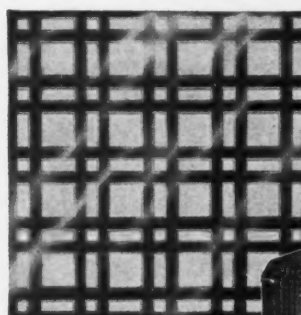
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consisting of two groups of vertical bendable bars for right and left deflection and with horizontal louvers to direct the air flow up or down or straight outward and to complete shut off. Being used on Housing Projects.

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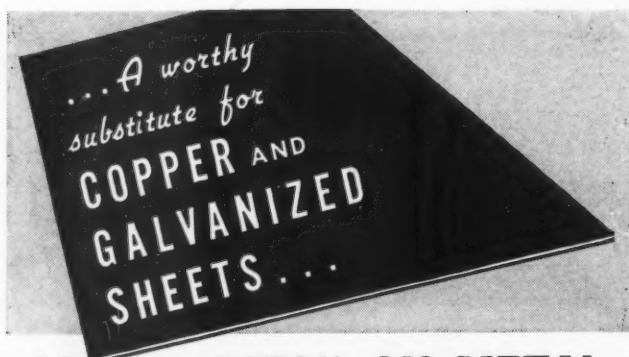
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This newly developed material consists of ferrous sheet metal which is completely protected by a heavy baked-on coating of coal tar pitch enamel. CHENEY PITCH-ON-METAL has the strength of steel and the flexibility of copper. It is not affected by weather, moisture, lime, or cement mortar and is resistant to most acid conditions.

Our experiments carried on with the government departments at Washington and with the Bureau of Standards definitely convinces us that our new product, CHENEY PITCH-ON-METAL, will prove a worthy substitute during the emergency.

**CHENEY BLACK FLASHING** is a new product identical in shape and form with the original Cheney Copper Flashing except that it is made of CHENEY PITCH-ON-METAL instead of copper.

**CHENEY BLACK REGLET** is made of CHENEY PITCH-ON-METAL and costs of both Black Flashing and Black Reglet are much less than copper.

**CHENEY PITCH-ON-METAL SHEETS** made in 24 x 96, 30 x 96, and 36 x 96 inches only, for use as counter-flashing, downspouts, gravel stops, valleys, termite shields, ducts, etc. 26 and 24 gauge.

**CHENEY PITCH PAINT** is necessary as a field coat after shop fabrication of CHENEY PITCH-ON-METAL SHEETS to seal any damage to the PITCH-ON coating.

**CHENEY PITCH-ON-METAL** can be satisfactorily painted any desirable color provided one coat of shellac is applied after all fabrication is completed.

We are now in production and complete stocks will soon be available at warehouses of Sheet Metal Distributors throughout the United States. Get in touch with your sheet metal distributor and if he has not yet received his stock and price information, communicate direct with us.

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Mr. Hoover has said.

Obviously, if it is a short War, the investor in repairs and refurbishing an old house may find he cannot earn enough out of the present shelter needs to cover his expenses. Government frankly admits under ordinary circumstances rehabilitation in many neighborhoods is far too expensive for the returns involved. Often the location is a liability. If the emphasis of the War changes, or if there are changes in details of War activities, the shift in the center of production or of War activities may leave a community high and dry. There also is the increased cost of materials and equipment, despite Government regulations; and the very definite rise in the cost of labor.

Government apparently realizes the lack of assurance that arrests the initiative of the average person in rehabilitating old homes and structures and it is not a remote possibility that Government may work out some form of insurance to protect the small investor against total loss. It is pointed out that labor costs are 28% higher than they were a year ago, and materials have risen 20% in the same period. The average construction cost is now 23% higher than it was a year ago. HOLC reported late in December that the outstanding debt on one to four-family, non-farm homes is \$20,000,000,000, the highest since the depth of the depression. Up to November everybody seemed to be scrambling to refinance home loans. In November the scramble abruptly stopped. If Government has any explanation for the phenomenon it does not say so. Most of the experts seem honestly bewildered. The most general, off the record, answer is that people were getting loans when they were easy to obtain in order to invest any surplus in stocks and reserves that might become scarce; and to pile up liabilities to beat the rising taxes.

**FIELD CONTROL DIVISION**  
MENDOTA, ILLINOIS





## The Milwaukee Plan of Priority Allocation

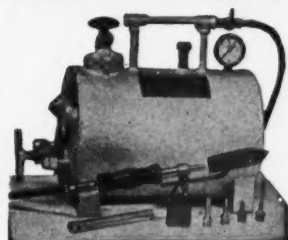
One of the Committees of the Milwaukee Forum, consisting of all those identified in the building industry, has presented "The Milwaukee Plan of Priority Allocation." The plan, according to Paul L. Biersach of the Milwaukee Sheet Metal Contractors Association, was favorably received and is now being considered by the proper authorities.

The aim is to find employment for employees of contractors who do not or are unable to obtain defense contracts, or for industries whose activities are curtailed by virtue of shortage of critical materials. In order to prevent wide-spread unemployment in the building construction industry, the Committee believes it is vital that methods be devised whereby private building construction can proceed.

The Committee has prepared accurate surveys indicating the quantity of critical materials involved in the construction of 4 residences ranging in price from \$5,000 to \$17,000, exclusive of land. The Committee finds from this survey that the larger the building becomes, the less of critical materials required per thousand hours of labor. The more expensive residences also provide work for many trades which are not used to any extent in the lowest price group and in defense construction.

The Committee recommends, therefore, that a definite ratio be established of critical materials to total cost of project and that this be the criterion by which permits be given for their construction and priority allocation for the purchase of the necessary materials on the critical list. The Committee believes that this need not necessarily apply to residential construction alone, but can be used to cover many other types of buildings. It will then be the duty of the architect or designer of the building to use such substitute materials as are available in order to keep his requirements of the critical materials within the ratio prescribed.

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Will Cut Soldering Costs in Half.  
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Now manufactured by Reiner & Campbell Co., Inc. Quick Set Dividers—fastest and most accurate on the market—two sizes for circles up to 36" and 48". Guaranteed—Order Now!

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**REINER & CAMPBELL CO., Inc.**  
667 Norwood Terrace, Elizabeth, N. J.



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Ask for SPECIAL DISCOUNT on Standard BARREL LOTS

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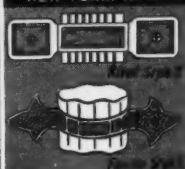
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Write Dept. AA for prices. To protect trade use your printed stationery.

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#### "RIVAL" and "FITRITE"

One-piece Ornamental Leader Straps. Made in Copper and Zinc in six styles. Pat. July 10, '28; Jan. 6, '31. Sold through jobbers only. Write for folder showing complete line and sizes. Send for free samples.



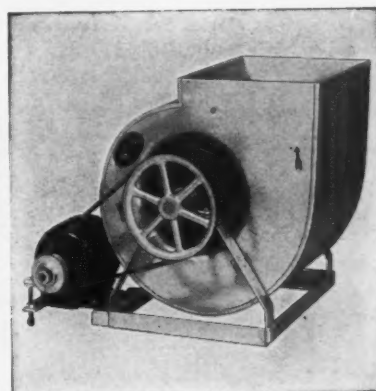
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ECONOMY  
BLOWER-  
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UNIT**

## for DEFENSE HOUSING HEATING EFFICIENCY

**BRUNDAGE BLOWERS** are keyed to our Defense Economy through stepping up warm air heating efficiency. Compact . . . sturdy . . . economical . . . easy-to-install Brundage Blowers represent profitable business for you in Defense Housing modernization and maintenance.

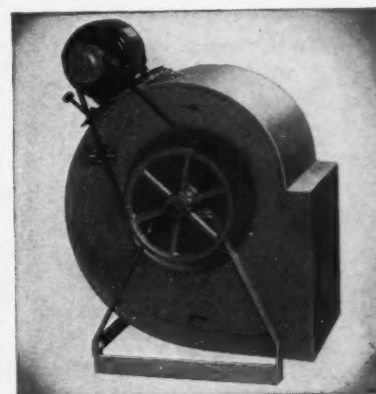
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Constructed in various types and capacities. Highest efficiency of forced air delivery under all conditions.



### MULTI-BLADE FAN WHEEL FEATURE

Brundage improved Multi-Blade Fan wheels are scientifically balanced with half-blade staggered construction. Quiet in operation.



### HAS SELF-ALIGNING BEARINGS

The Brundage centrifugal fan operates on cushioned bronze bearings enclosed in self-aligning, self-lubricating, housing.

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**The BRUNDAGE CO.**  
— BLOWER SPECIALISTS —  
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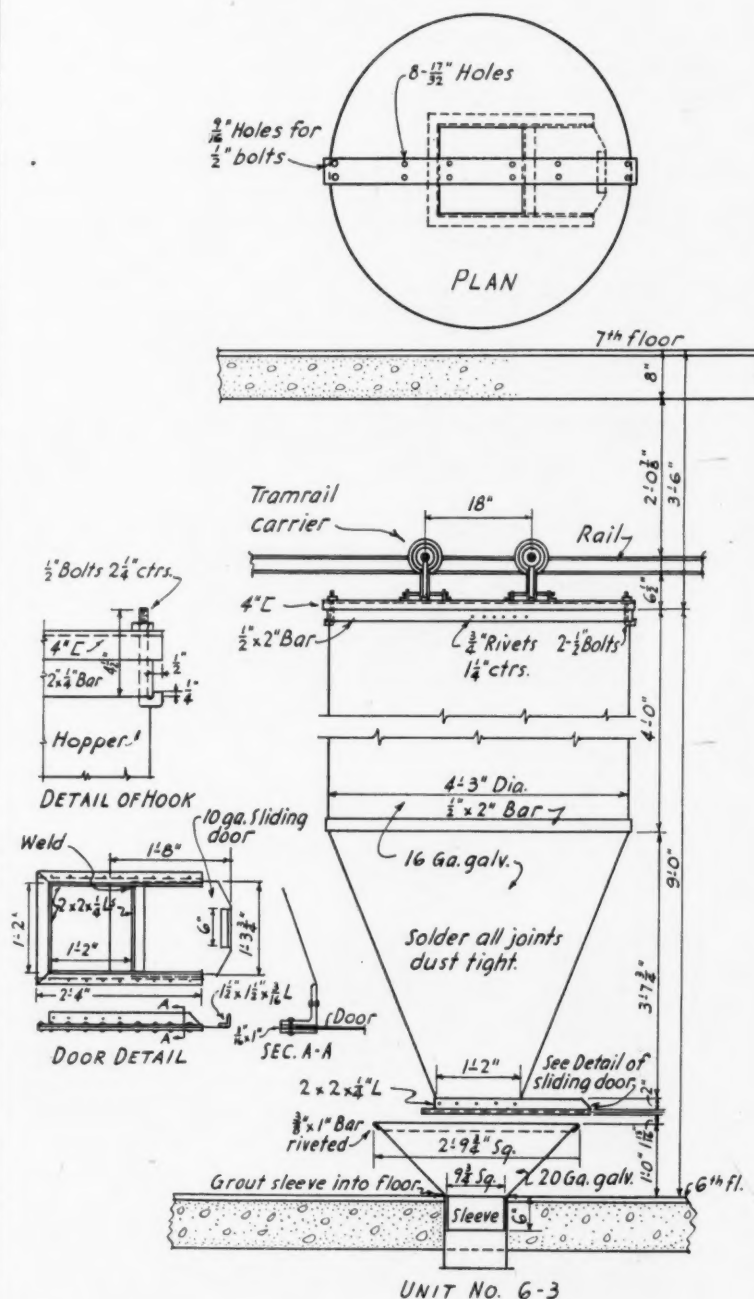
## Tanks, Bins And Hoppers

(Continued from page 158)

joined together with lapped, riveted and soldered seams. The unit, 12 feet high and 4 feet in diameter, was made complete in the shop and weighed about 600 pounds.

Stiffening and support were obtained by the 2x2x3/16-inch black iron bottom flange on which the tank stands and a similar angle riveted around the top. To this top angle the 16-gauge cover is bolted with a felt packing to obtain dust tightness.

Tanks of this type have inset, hopper bottoms,



One of the interesting units is this trolley charging bin (40 fabricated) fabricated as shown in galvanized iron. The sliding discharge gate is similar to gate in unit 6-1.

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## THARCO ASBESTOS FURNACE CEMENT

WITH National Defense placing emphasis on fuel saving, home owners will demand more of their furnace than ever before. Many furnaces will need repairs. The next time you get a furnace repair job remember THARCO. It's the one furnace cement you can always depend upon to give satisfactory results.

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DETROIT DALLAS CHICAGO

## Heating Plant

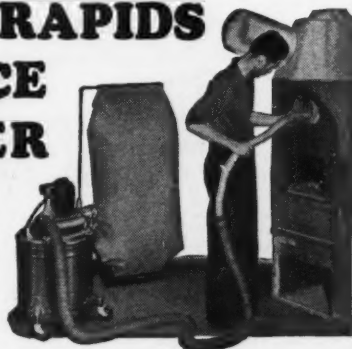
**maintenance and repair is essential. Be sure of work with a**

## GRAND RAPIDS FURNACE CLEANER

**Free Trial  
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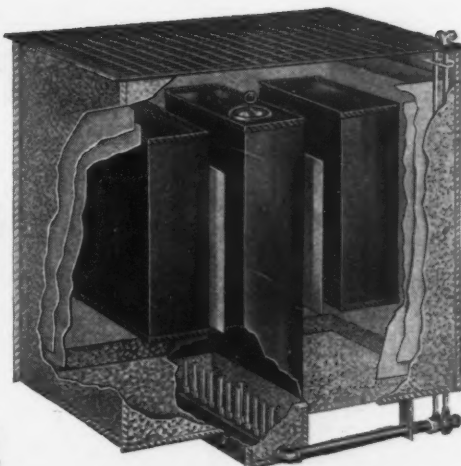
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**GIVE  
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CUSTOMERS  
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## Install COLE'S FLOOR GAS FIRED FURNACES



Here is the floor furnace that burns natural, artificial or mixed Propane or Butane gases with greatest economy and efficiency . . . Cole's Gas Fired Floor Furnaces are equipped with the patented burner whose automatic air intake requires no air adjustments.

The inner heating unit of the Cole Floor Furnace is of full vitreous porcelain enamel. Three walled galvanized steel casing.

Large heating surface and long delayed flue travel get maximum efficiency from fuel. Unit crimped and sealed by special Cole process insuring gas-tight and stay-tight construction.

Combination safety pilot and automatic thermostatic heat control available for all Cole Floor Furnaces.

Write for full details today.

## COLE HOT BLAST MFG. CO.

3108 West 51st St.

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## Libert *Hi-Speed* SHEAR

**HANDIEST PIECE OF EQUIPMENT  
IN ANY SHEET METAL SHOP**

The LIBERT cuts a greater variety of work — and does it better—than almost any machine in the shop. For instance, rings, circles, splits, plain and fancy shapes, sharp or round corners in almost any material can be sheared faster, more accurately, easier, and without numerous machine changes. Think what such VERSATILITY will do to YOUR production! Write for bulletin or demonstration.

**LIBERT MACHINE COMPANY**  
Green Bay, Wisconsin



★  
Model 1036  
General Utility  
Shear—36" throat



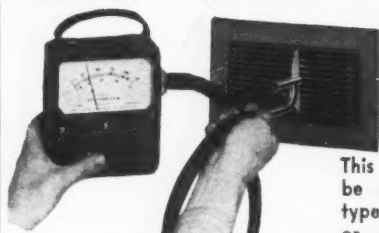
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Manufacturers of  
Quality Shears  
since 1915



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## NOW! ACCURATE AIR VELOCITY MEASUREMENTS at INTAKE GRILLES!



This new jet attachment can be added to existing Tube-type Velometers now in use, or can be purchased with

other standard jets and new Velometers.

The new intake grille jet is offered only in the spot type since the center reading only has proven to be sufficiently accurate for all commercial purposes. Write for information.



**Illinois Testing Laboratories Inc.**

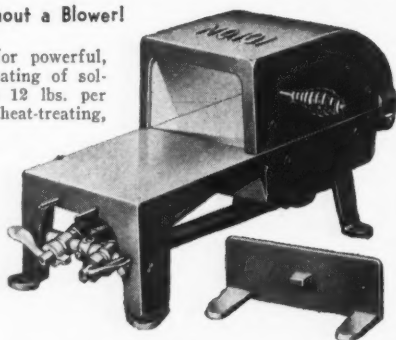
412 N. La Salle St., Chicago, Ill.

## JOHNSON No. 101 BENCH FURNACE

Gives 1800° F. Without a Blower!

Use this furnace for powerful, speedy, economical heating of soldering coppers up to 12 lbs. per pair. Efficient for heat-treating, tempering, annealing or case-hardening carbon steel tools. Equipped with shut-off valve and pilot light.

Write for Catalog and Prices



**JOHNSON GAS APPLIANCE CO.**  
Cedar Rapids IOWA

564 E Ave. NW  
OUR 41st YEAR

## Why QUIET-AIRE Blowers Stay Quiet!

Precision building keeps QUIET-AIRE Blowers quiet! Balanced statically and dynamically, with intake in scientific ratio to output capacity. 5 yr. guaranteed bearings and flexible motor mount eliminate adjustments, stop noise.

★

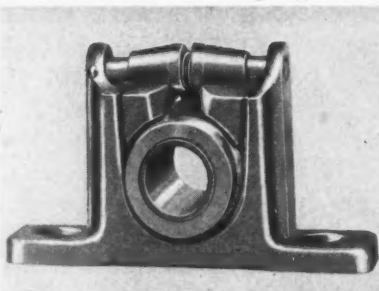
### Furnace Manufacturers

QUIET-AIRE Blowers move more air—you use smaller. Saves room.

### ★ Jobbers and Dealers

QUIET-AIRE performance—guaranteed greater capacity—and exclusive features build sales, let you MAKE and KEEP a profit. Write today for information.

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## Bremil PORTABLE SHEARS



Your work will proceed faster and neater when you use Bremil Portable Shears on the job or in the shop. Write today for literature showing complete line. Prompt shipment can be made from stock.

ALL-ALLOY No. 2 cuts up to 1/4" steel plate.

ALL-ALLOY No. 1 cuts up to No. 11 gauge strip or sheet.

Special blades may be obtained for shearing stainless steel.

**BREMIL MFG. CO., ERIE, PA.**

of 14 gauge, rolled from two sheets with a flange at the top to rivet the hopper inside the bottom tank section. A discharge collar is provided at the bottom.

### Tram Rail Tanks

Goergen-Mackwirth furnished 40 of the tram-rail tanks of which unit 6-3 is typical. The hoppers and sleeves into which these tanks empty were furnished and installed by others. The tramrail was installed by others, as was the tram-rail carrier on which each tank moves.

The 16-gauge tank (4 feet deep and 4 feet 3 inches in diameter) was made by lap seaming and riveting two sheets. The hopper, about 3 1/2 feet deep, is secured to the tank by lapping the hopper flange over the tank lower edge and riveting the two together through a 1/4 by 2-inch flat bar. A similar 1/4 by 2-inch flat bar is riveted around the tank top and the hooked bolts of the carrier hold the tank to the carrier as shown in the top plan and detail of the hook.

The slide gate at the hopper bottom was constructed as described previously with a double-decked, three-sided angle iron frame spaced apart to take the 10-gauge slide.

Goergen-Mackwirth delivered these tanks with hook holes provided so that all that was necessary was to put hooks through tank rims and pull the bolts up tight so that the carrier was securely connected to the tank.

## Standard Code Application Manual for Gravity Warm Air Heating Systems

Sample copies of the "Standard Code Application Manual" were mailed to members of the National Warm Air Heating and Air Conditioning Association on November 19 with the request that they (the members) distribute copies to jobbers and dealers. Members were requested to conform, insofar as practicable, with the recommended sizes given. The association urged members to replace present methods of figuring heat losses with the new association method, and invited complete co-operation with the practices defined in this manual.

The manual is an industry product and comes at a time when conservation of materials, elimination of odd sizes, and rehabilitation of existing furnace heating systems is the primary aim of the industry.

The sizes recommended have been approved by industry action.

The recommended installation procedure is based on good industry practice.

The time-saving, accurate tables of heat loss factors will be an industry tool.

The rating tables are derived from industry research on industry products at the University of Illinois.

Heat Loss Data Sheets and Work Sheets, printed on opposite sides of each sheet come in padded form of 100 sheets—\$1.25 a pad. Each Standard Code Application Manual will include price information with request that order with check be mailed direct to the association.

Single copies are 40 cents each, with discounts for quantity orders. Manufacturers are requested to see that engineering and sales forces, as well as dealer outlets, have a copy. (Section E, Table 5, lists standard sizes for gravity fittings that have been approved by the industry.)

Copies of the Manual have been distributed to the Federal Housing Agency, the National Bureau of Standards, and all other agencies concerned with standardization and the elimination of waste.

## COLD RUNS BANISHED!



### THE VICTOR HEAT BOOSTER



This amazingly effective device not only boosts hot air into hard-to-heat rooms, it boosts profits into the pocket of the furnace man.

The Victor Booster needs only to be set in place, plugged into any electric outlet, and out pours a rich flow of hot air—not from an overfired furnace, but from an ordinary everyday fire. Two models, floor and wall. Liberal Discounts. Write today for detailed literature and prices.

**VICTOR ELECTRIC PRODUCTS, Inc.**  
Dept. HB-7 2950 Robertson Ave. Cincinnati, Ohio

**ASK YOUR JOBBER OR WRITE DIRECT**

**HELP YOUR CUSTOMERS**

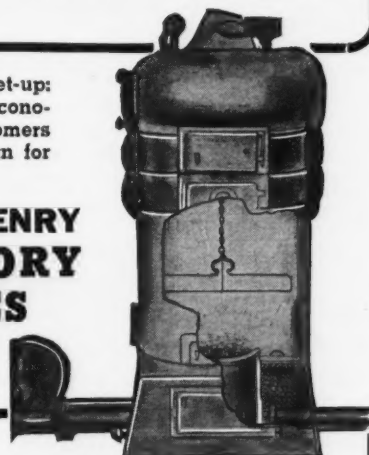
## SAVE FUEL

**IN ALL FURNACE TYPES!**

—here's a swell set-up:  
10% to 25% fuel economies  
for your customers  
—a juicy profit plan for  
you!

### McLEOD & HENRY REFRACTORY BAFFLES

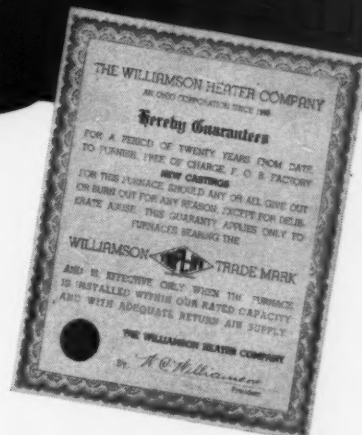
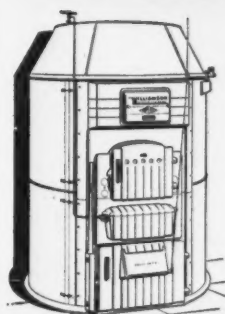
WRITE FOR  
BULLETIN J-34



Our Baffle Plates are scientifically designed to deflect flames to heating surfaces, insuring greater heat absorption, higher CO<sub>2</sub>, lower chimney losses, and cleaner flues. Low-priced for quick turnover and rapid profits. We help you to sell with FREE AD MATS, DIRECT MAIL AND DISPLAYS.

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Established 1825 TROY, NEW YORK

## "Dealer Features Tripl-life 20-Year Guarantee"



"The outstanding point that I use in closing my sales, is the exclusive 20-year guarantee made possible only by 'Tripl-life' iron, an unusually tough, high-heat-resisting metal, developed by Williamson after years of careful research. This is such an outstanding owner benefit, the prospect cannot fail to recognize at once what this means to him. He will immediately see that he will be assured years of trouble-free comfort and heating satisfaction. He will see that he will have no parts to replace for 20 years."

The Williamson 20-year guarantee attracts attention—wins confidence—closes sales. Write Dept. 2 for details of "Tripl-life" Profit Plan for 1942.

THE WILLIAMSON HEATER COMPANY, CINCINNATI, OHIO

**WILLIAMSON**  
WARM AIR FURNACES

## He Can't Get New Plants to Sell But Super Cleaning Pays Him Well

• His patriotic duty was to help home owners stop wasting fuel in dirty heating plants. Same for you, too. Is not any man a slacker if he fails to urge the repair of all furnaces that need new parts or service? You know he is. America has no fuel to waste. Materials for new plants are far below normal volume. Super-cleaning pays you well. It pays the home owner better. It serves the Nation. Why not get out, as he did, and make yourself much money doing your obvious duty to your country, your neighbors and yourself?



Only the Super Red Streak comes complete with special chimney cleaning tools which make that job easy. Homes want that always.

**-----USE THIS COUPON-----**

The National Super Service Company  
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Send me the Plan Book and complete information about your free trial and the new low-priced Super.

Name .....

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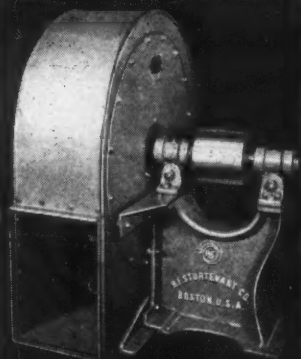
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## MILL EXHAUSTERS

1. Designed and built by the **Pioneer** exhauster manufacturer.
2. Result of over 80 years of air engineering experience.
3. High efficiency assures low power consumption.
4. Sturdy construction assures dependable service.

Write for Catalog No. 430  
**B. F. STURTEVANT CO.**  
 HydePark, Boston, Mass.  
 Branches in Principal Cities



## Special Soldering Materials

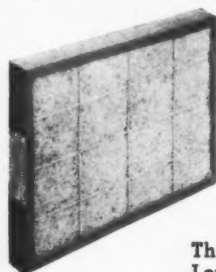
**FOR STAINLESS STEEL** Ruby's Stainless Steel Flux is a special formula for soldering this metal without discoloration. Metals fuse perfectly. No special equipment or excessive heat needed. Recommended by Stainless Steel fabricators.

**FOR GENERAL SOLDERING & TINNING** Rubyfluid better than fills the demands for an easy-to-use, fast acting flux that helps produce neat, strong unions. Gives off no objectionable or dangerous fumes. Also available in paste form. Order from your jobber or write to

**Ruby Chemical Co.**  
 74 McDowell St., Columbus, Ohio



# Rubyfluid



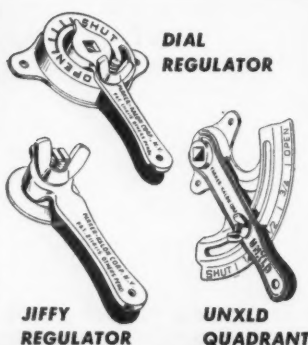
## AXIOM AIR FILTER

The result of fifteen years experience  
 Lower in cost — Higher in quality  
 Huge dust capacity—low resistance  
 Prompt delivery assured  
 Order now

**BLOCKSOM & COMPANY, MICHIGAN CITY, INDIANA**

## A Type And Size For Every Need

For efficiently controlling light and medium dampers in heating, ventilating and air conditioning systems, specify Parker-Kalon Damper Controls. The line includes all types and sizes, at a range of prices to fit the needs of any job. Parker-Kalon Corp., 190-192 Varick Street, New York.



## PARKER-KALON damper controls

## Air Conditioning A Woolworth Store

(Continued from page 138)

(1,000 cfm.). Woolworth has pioneered an exhaust hood feature which is now standard practice in all their stores. The air pulled through the hood is passed through a bank of filters just before the air enters the main exhaust line. All air borne grease or fats are thus removed and the exhaust ducts remain free from fire hazard.

To replace basement air vented and to eliminate the cost of heating replacement air for the basement, two conditioning units located in the



In the ceiling is one of the lighting fixtures. The diffusers (see first floor plan) are placed to spread the air uniformly over the room. Above the door is the horizontal warm air grille which tempers outside air brought in as the door is opened.

basement draw air from grilles in the outside walls below show windows, and another unit located in the engine room of the second floor heats, filters and circulates the air into the basement. These units and duct work are shown on the basement plan. Air pushed into the basement by these units enters the kitchen through a bank of filters in a kitchen partition wall. To prevent cold drafts due to passage through the entrance doors two heating units are located in the basement. Each unit provides heated air to two doors (there being a total of four doors) by means of insulated duct work which carries the air to grilles located over the doors and from which it is discharged directly downward. The air around



## PERFORATED METALS

FOR ALL INDUSTRIAL USES

Perforations in  
**HEAVY PLATES**

**DIAMOND MFG. CO.**  
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**YOU'LL SELL THEM FASTER  
WITH  
HESS  
QUALITY EQUIPMENT**

Defense workers, bankers, salesmen—these are your customers—people who appreciate the precision craftsmanship of the HESS line of quality heating equipment. You'll profit by HESS' financing and territory plan.

**DEALERS:**  
Write TODAY for New 1942 Portfolio!

**IN 1942 FEATURE—**  
selling, modernizing, replacements and repairing with

- ★ HESS Blower Filter Units
- ★ HESS Welded Steel Furnaces
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Quality Equipment from HESS  
Costs Less!

**HESS WARMING & VENTILATING CO.**  
1211 S. Western Avenue CHICAGO, ILLINOIS  
Founded 1873

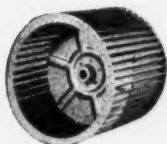
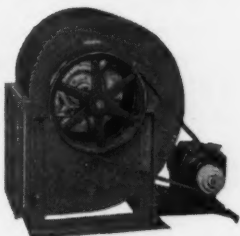
## YOUR BLOWER REQUIREMENTS

available at

**Schwitzer-Cummins Company**

### ● BLOWERS FOR EVERY PURPOSE

HY-DUTY Blowers, 9 3/4" to 25".  
Top and Bottom Horizontal, and Top and Bottom Vertical Discharge.  
Top and Bottom Motor Mounting.  
Dual Units also available.



### ● CENTER DISC WHEEL

Double Inlet, Double Width.  
Reinforced Center Disc.  
Designed for Modern Air Conditioning and Heating Applications.  
Sizes, 4 1/2" to 50".

### ● SINGLE INLET WHEELS

For Oil Burner, Stoker, and Air Conditioning Applications.  
Sizes, 4 1/2" to 50".  
Variety of Blade Lengths for each diameter.



### ● ENGINEERING DATA

Write for Catalogues showing complete Performance Data.  
Experienced Engineering Department available to help solve your Air Handling Problems.

**BLOWER DIVISION  
SCHWITZER-CUMMINS COMPANY**  
125 JAN STREET INDIANAPOLIS, U. S. A.

## G&O COILS



**FOR  
HEATING AND COOLING  
IN  
A WIDE RANGE OF SIZES**

Detail of mechanical joint  
used in Universal Heat  
Transfer Coils.

Send for Catalog

**THE G&O MANUFACTURING COMPANY**  
New Haven, Connecticut  
Pioneer Manufacturers of Square Finned Tubing in the United States

*The "QUALITY" Nail!*

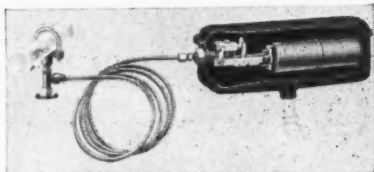
## DENISTON TRIPLE LOCK LEAD SEAL ROOFING NAILS

Look at it! . . . You can SEE the superiority of this nail! The lead, under the head and down the shank, plugs the hole around the nail with lead to form a weatherproof seal . . . the "bump" triple-locks nail, lead and sheet solidly together . . . when the nail is driven through sheet metal roofing the drive screw shank gives greater holding power than even the Deniston ring shank nail. No loosened roofing, no leakage. Insure QUALITY roofing jobs with Deniston QUALITY Nails. Full details and prices, with samples and demonstrator blocks, FREE.

**The DENISTON Co.**  
4856 SO. WESTERN AVE., CHICAGO



### The valve that MAKES HUMIDIFICATION UNFAILING



HERE'S a float valve that you can depend upon. Its patented "snap action" knows only two positions—wide-open or tight-closed. The wide-open flow prevents plugging and the tight closure prevents flooding. Use it where other valves have failed and see the difference!

**MCDONNELL & MILLER**  
1318 Wrigley Building, Chicago, Ill.

**The  
McDONNELL  
Humidifier  
Water Control**

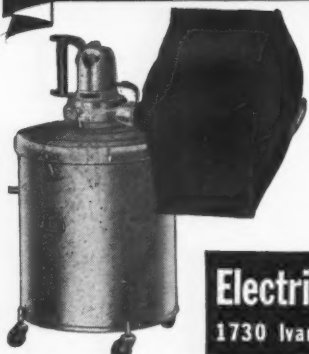
## BUFFALO'S Best Located Hotel BUT THAT'S NOT ALL!



At Hotel Lafayette you're in the heart of Buffalo's shopping, theatre, and business district. Important, sure. But you also enjoy the prestige and comfort of a truly fine hotel—excellent rooms, restful beds, superb food. Moderate rates: Single, \$2.75 up; double, \$4.50 up. Special rates for 4 or more. Write for Folder I-10.

*Hotel* **LAFAYETTE**  
K.A. KELLY MANAGER  
BUFFALO, N.Y.

## Premier FURNACE CLEANER



### KEYED TO 1942 NEEDS

Fast . . . efficient . . . saves fuel  
. . . builds service business!  
Write today for literature and complete information.

**COMPLETELY EQUIPPED**

½ H.P. \$74.50 • 1 H.P. \$89.50  
Complete chimney cleaning  
equipment only . . . \$10.00

**Electric Vacuum Cleaner Co.**

1730 Ivanhoe Road • Cleveland, Ohio

the doors is drawn into grilles at the floor line on each side of the doors and is carried in ducts to the heating units. Each unit has a 3000 cfm. capacity and is complete with filters, heating coils, fan, fan motor and V-belt drive.

### Adjustable Counter Exhaust Duct

The restaurant has the usual number of steam tables, coffee urns, toasters and other heat and odor disseminating equipment, all of which is located against the walls. Over the continuous length of the walls Woolworth has placed an ornamental, yet inconspicuous, back bar exhaust hood. On three foot centers, dampered openings are provided which are in turn connected to an exhaust duct running above the entire length of the hood. The dampered openings are open only over the equipment which give off heat and odors and all the other openings are closed tight. By this means a very flexible exhaust system is provided which removes air only where required, yet should it be necessary to move the heat and odor giving equipment to other locations, the exhaust openings can be moved also.

All of these smaller systems require ducts of fairly small size. It was possible, therefore, for Mannen & Roth to fabricate complete sections ready to erect with fittings. This part of the installation was not, of course, as trouble-free to place as the larger, simpler sections. When this work was reached, numerous job measurements were taken and then fairly small amounts of pipe work were made up at one time. In addition, some extra fitting could not be avoided and was done in the building.

The equipment housings shown on the plans were made with angle iron framing covered with standing seam galvanized iron.

This contract was undertaken and completed at a time when Mannen and Roth was also busy with other work. Despite this handicap the work was completed on schedule, but a large measure of credit for the smooth progress of the work should be laid to the long hours of planning between designing engineers, Woolworth officials and the sheet metal contractor.

### Blowers and Filters and the Excise Tax

A Committee consisting of M. Levy and R. Mayne, representing blower manufacturers, went to Washington to contact the Excise Tax Division of the Bureau of Internal Revenue, and based on the information received as a result of this Washington contact, it would seem that a favorable decision will later be given: that is, blowers designed for use on forced warm air heating units will not be subject to the Excise Tax. Messrs. Levy and Mayne made a very excellent presentation of their case. The tax authorities have asked the committee to confirm their presentation in writing.

In connection with filters, the National Warm Air Heating and Air Conditioning Association understands that the Excise Tax Division has advised that filters for or suitable for self-contained air conditioning units are taxable and that therefore all filters used on forced warm air heating installations are subject to tax.



# Let ALLENS Clear the Atmosphere!

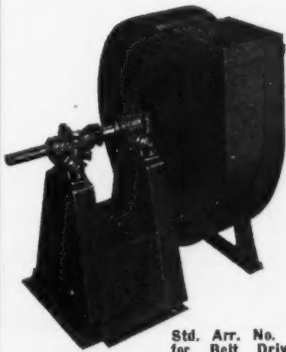


The complete, widely varied line of automatic and power-driven ALLEN VENTILATORS supplies the sheet metal man with the "answer" to every ventilation job, on all sizes and types of buildings. Because of the extremely high quality and perfection of engineering design, found in every Allen type, you assure satisfaction of your customers (and thus continued repeat business) by always installing ALLENS.

We do not compete with the sheet metal contractor in any way, but cooperate with you closely. You supply stacks and ducts, in addition to installing the ventilators. Our engineering service is at your disposal, free of charge.

Write today for complete information for your files.

**The ALLEN Corporation**  
9752 ERWIN AVE. DETROIT, MICHIGAN

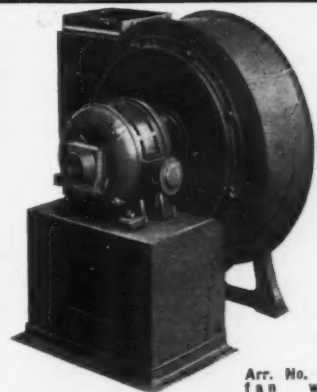


Std. Arr. No. 1  
for Belt Drive

New and improved "EX" Fans are now available in standard sizes from No. 15 to No. 80 and from 200 to 30,000 CFM Capacity with pressures up to 15" W.G. These fans are commonly used for exhaust problems to handle dust, fumes, shavings, etc., but can be adapted for forced draft service.

"EX" Fans are furnished in all standard arrangements of the N.A.F.M. The design is such that it can be easily modified to suit special assemblies, thus "EX" Fans are ideal for resale purposes as part of factory assembled units.

Write us about your problem. Send for Bulletin No. EX-41



Arr. No. 4 with  
fan wheel  
mounted directly on motor shaft.

**BAYLEY BLOWER COMPANY, 1817 South 66th Street, MILWAUKEE, WISCONSIN**

**SERVICE SECTION:** Rates—\$5.00 per inch per insertion. One inch minimum. **CLASSIFIED SECTION:** 5 cents for each word including heading and address. Count seven words for keyed address. \$1.00 minimum. Cash must accompany order.

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### ALLEN "All-Metal" SCRATCH BRUSHES

A remarkable brush for speedily removing rust, corrosion, brightening metal. Brush is all metal, hence can be used under torch flame, etc. Brush can be cut off at end, thus renewing life as front end wears down. Bristles of tough, strong steel. Three brushes like illustration. Also one all metal brush, "straight-construction" for battery work, etc. Send for FREE samples. Send us your jobber's name and we will send you a junior all-metal Scratch Brush.

Buy ALLEN Fluxes and Soders at Your Jobber's  
**L. B. ALLEN CO., Inc.**  
6782 Bryn Mawr Chicago, Ill.



### ALLEN "ALL-SOL" STAINLESS STEEL SOLDERING FLUX

Here's a remarkable, fast flux that makes the soldering of stainless steel as easy as soldering tin plate. (Also available in a special odorless formula where less strength is required.) "ALL-SOL" works with all solders quickly, cheaply and efficiently. Send for free samples. Buy Allen Fluxes and Soders at your Jobbers.

**L. B. ALLEN CO., Inc.**  
6782 Bryn Mawr Chicago, Ill.



### ALLEN SODER-ING SALTS

An all around flux in convenient powder form; just add water 3 to 5 times according to metal to be soldered. Soders all metals but aluminum. Takes a quick bite and makes the solder hold on. Non acid. Comes packed in metal or glass as preferred. Send for FREE samples.

Buy ALLEN Fluxes and Soders at Your Jobber's

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HAND: 4'16, 6'16, 8'14, 8'16, 8'14, 10'14;  
BOX & PAN: 4'14, 7'14, 8'16;  
POWER: 8'14, 4'14, 6'12, 8'10, 10'10, 10'14

**CRIMPERS & BEADERS**  
No. 0585 Pexto; Nia. Heavy Duty; Wheeler 22 ga.

**PRESSES—DEEP THROAT**  
Nos. 10 & 20 Excelsior; No. 135-A Niagara;

No. 15 Toledo; No. 12 Consolidated;

**PRESSES—OBI**  
Nos. 1, 2, 3, 4, & 5 B&J carried in stock

No. 1 Toledo, No. 1 1/2 V&O; Nos. 0 & 1 Rousselle;

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No. 4 1/2 P Michigan; No. 5 Cons. & Toledo;

**PUNCHES—SINGLE END**  
No. A-18 & No. 62 Beloit; Cleveland 60" thr.;

Kling 48" thr.; Nos. 5 1/2 & 2 Hilles & Jones;

Ryerson—capacity 1/4" thru 1/2"

**INTERSTATE MACHINERY CO., INC. — YARDS 5800**  
1433 W. PERSHING RD., CHICAGO, ILL.

**ROLLS**  
HAND SLIP: 30" & 36" Pexto; 30"x2" Niagara;  
POWER: 38"x4" Bertsch; 32"x6" Robinson;

36"x4" Niagara; 38" 10 ga. Pexto; 10' 1/2" Nia.;

10' 3/4" Columbus; 10' Wickes Vertical;

**SHEARS**  
POWER: 12' 14 ga. Strelne; 11'16 ga. Obl; 10' 1/2" Cln.;

8' 1/2" Toledo; 4'1" Bertsch; 6'14 ga. Nia.;

5'16 ga. Nia.; 42"10 ga. Kutscheid; 36"14 ga.;

36"18 ga. 30" 18;

**FOOT: 22" & 30" Pexto; 24" Hull; 30" & 36" Nia.;**

42" Kut.;

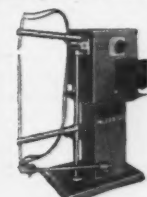
**WELDERS**  
ARC: 150 amp; 175 amp; 200 amp; 350 amp; 400

amp;

BUTT: 5 KVA; 10 KVA; 20 KW; 35 KVA; 40

KW; 45 KW;

### WELDING HEADQUARTERS



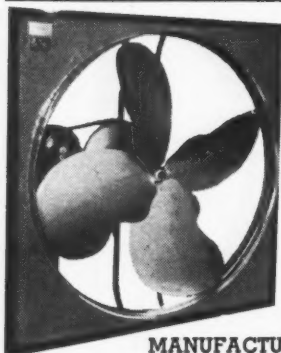
Electric welding equipment of every description to weld from a watch case to a door. Special or standard SPOT WELDERS from 1/4 to 500 K.V.A. A.C. Arc Welders from 100 to 400 Amps. We invite contract Spot Welding in large or small quantities.

**EISLER ENGINEERING CO.**

CHAS. EISLER  
761 S. 13th St. (Near Avon Ave.) Newark, N. J.



# AMERICAN ARTISAN Service Section



## SIZES

30"  
36"  
42"  
48"  
54"  
60"

G. E.  
Motors

**ALCO**  
MANUFACTURING CO.

2619 Milam St.

Houston, Tex.

## DRAFT CORRECTORS

FOOL PROOF  
ADJUSTMENT

UNIVERSAL  
SLEEVE OR  
ADAPTER

KNIFE EDGE  
BEARING

ALL STEEL  
CONSTRUCTION

1. Heavy all steel construction
2. Knife-edge frictionless bearings
3. Draft adjustment semi-concealed
4. Counter balance blade
5. Underwriters approved

Write for literature.

**COLE-SULLIVAN**  
ENGINEERING CO.

1316 N. 3rd Street  
Minneapolis, Minn.

## FASTER, BETTER VENTILATION WITH ACCURATE VENTILATORS

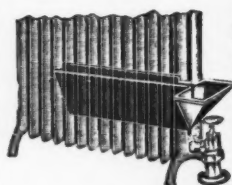
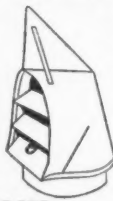
Get on the money-making band wagon! Sell and install Accurate Ventilators on new or old buildings.

They are made in various sizes, and are priced to help you meet and beat your competition.

WRITE US TODAY FOR LITERATURE, PRICES AND IMPORTANT VENTILATION DATA.

See our advertisement in Sweet's Catalog.

**ACCURATE MFG. WORKS**  
2336-38 Milwaukee Ave. Chicago, Ill.



**FULTON**  
HUMIDIFIERS  
are priced low enough for every home owner to afford one for every radiator or register in the home.

We have an attractive and profitable dealer proposition.

DO YOU WANT THE HUMIDIFIER BUSINESS ON A PRICE AND EFFICIENCY BASIS

Now is the time to take on the FULTON Line

**PATENT NOVELTY CO.,** Fulton, Ill.

## BLOWERS — FANS — EXHAUSTERS

THOROUGHLY REBUILT, for perfect performance. All types; all standard makes. All sizes including the big ones. Hundreds in stock, meeting all requirements. Attractive prices. Fully guaranteed. Expert engineering counsel. **GENERAL BLOWER CO.,** Engineers, 403 North Peoria Street, Chicago, Illinois.

## Better for Every Spraying Purpose MARLEY SPRAY NOZZLES



"Tops" for Air Washing, Humidifying, Brine Spray Lofts, etc. Marley nozzles lead all in sales and in profits to you.

Finer, more uniform spray. Effective operation at Low Pressures saves on pumping cost. No internal parts to clog or wear. ★ Longer life, superior materials and workmanship.

Write for Literature Now!  
**MARLEY CO.** Kansas City, Kansas

## WILLIS

HIPPED



## SKYLIGHT and VENTILATOR

Constructed of quality materials to give greatest amount of light and maximum strength of construction. Ventilator is absolutely water tight. Pivoted metal dampers will be included with ventilators, so hung that normally they will be closed. Skylights can be constructed to any size required.

Write for our Skylight Catalog No. 10

**WILLIS STEEL CORPORATION**  
Galesburg, Illinois

**JOHNSON'S**  
NEW HANDY MANUAL  
on  
HEATING, VENTILATING  
MECHANICAL REFRIGERATION  
and  
AIR CONDITIONING

432 pages of practical, condensed information, tables, rules and diagrams. Price \$1.00—Remit with order to

**KEENEY PUBLISHING COMPANY**  
6 N. Michigan Ave., Chicago, Ill.

## "CENTRAL-WEST" can furnish your Sheet Metal Machinery Requirements

● Steel Hand Brakes ● Press Brakes ● 'Rex' Spot Welders  
— LOCKFORMERS —

● 'Pexto' Shears, Folders, Rolls, Rotary Machines, Etc.  
● Whitney Tools ● Electric Shears, Drills ● Shop Tools  
— Smith Cleat Benders —

Complete Line of Sheet Metal and Ventilating Supplies  
FRED E. MILLER—"Always Ready to Serve You"—N. A. LINDVALL

**CENTRAL-WEST MACHINERY CO.**

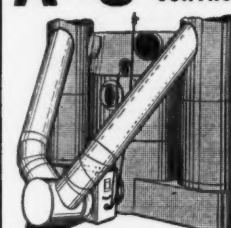
Not Inc.  
335 S. Western Ave. - Haymarket 8361 - Chicago, Illinois

## RUBBER SHOES FOR LADDERS

- PREVENT SLIPPING
- MAKE CLIMBING SAFE
- Send in Your Order Today \$1.00 per pair You will like them

**JOHNSON LADDER SHOE CO.** EAU CLAIRE, WIS.

## A-C THERMOSTATICALLY CONTROLLED AUTOMATIC



## HEAT BOOSTER

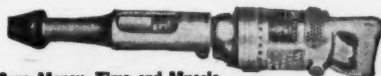
Everything the Home Owner wants in a Furnace Fan—At a price Every Furnace Owner Can Afford to Pay.

Write Today or See Your Jobber

**A-C MANUFACTURING CO.**  
PONTIAC ILLINOIS

**SERVICE SECTION:** Rates for display space similar to above in Service Section are \$5.00 per inch per insertion. One-inch minimum space accepted. **Classified Section:** Rates for classified advertising are 5 cents for each word including heading and address. Count seven words for keyed address. Minimum \$1.00 for each insertion. Cash must accompany order.

# AMERICAN ARTISAN Service Section



## Save Money, Time and Muscle

Drill Concrete with the "De-All" Combination Electric Hammer and Drill. Set expansion bolts 10 to 20 times faster than with hand tools. Drills concrete, brick, stone, metal, wood. Easy to maintain. Weighs 15 lbs. Drills to 1 1/2" in concrete. 2400 blows per min. Bulletin 400. Phone Austin 9866.

WODACK ELECTRIC TOOL CORPORATION  
4644 W. Huron St., Chicago, Ill.

## LOWEST PRICES ON

Blowers, Booster Fans, Oil Burners, Oil Furnaces, Oil Water Heaters, Oil Burner Repairs, Stokers, Stoker Furnaces, Coal Furnaces, Gas Burners, Gas Furnaces, Automatic Gas Water Heaters, Gas Ranges and Cookers, Electric Water Heaters, Air Filters, Humidifiers, Furnace Cement, Registers & Grilles, Cooling Coils, Evaporative Coolers and Parts, Hot Water Circulator Pumps, Electric Cellar Drainers, Automatic Controls for Gas, Oil, Coal and Stokers.

B. C. Biggs Supply Co., Lincoln, Nebr.

## Classified

### WANTED

WANTED: Completely equipped sheet metal shop in Iowa, Nebraska, Minnesota or South Dakota. State Terms. Write, Box 553, Yankton, South Dakota.

### AGENTS WANTED

#### NEW PROFITS FOR MANUFACTURERS' AGENTS

##### AGENTS WANTED

Manufacturers' Agents—to represent the nationally recognized line of "Research" Air Filters. Only agents with experience, who are established and have a following among wholesalers, dealers and contractors in the heating, ventilating and air conditioning trade in territory, will be considered. Address inquiries to RESEARCH PRODUCTS CORPORATION, Madison, Wisconsin.

### BOOKS

#### AIR CONDITIONING FOR COMFORT

Third Edition—285 Pages—\$2.00

An exhaustive and clear treatment of the subject of air conditioning. Covers psychrometry, humidifying, dehumidifying, mechanical refrigeration, heat transmission, air volumes, infiltration, air distribution, water circulation, etc. An invaluable reference book that belongs in the hands of everyone interested in or doing air conditioning work. Order from Keeney Publishing Co., 6 North Michigan Ave., Chicago, Ill.

The American Artisan Service Section presents a golden opportunity to contact a national circulation at comparatively small cost. Manufacturers can use it to make any article sell and dealers will find it an inexpensive way to contact a live buying trade. Don't delay—send in your copy now for the next issue. See bottom of page for rates.

**SERVICE SECTION:** Rates for display space similar to above in Service Section are \$5.00 per inch per insertion. One-inch minimum space accepted. **Classified Section:** Rates for classified advertising are 5 cents for each word including heading and address. Count seven words for keyed address. Minimum \$1.00 for each insertion. Cash must accompany order.



## The Electric City Gutter Former

MAKE YOUR OWN GUTTER AS YOU WANT IT  
Easily and quickly operated. Soon pays for itself.

### REPLACEMENTS

Beading Rods, Handies, Bolts, etc., quickly furnished.

### STERLING BEADER

A simple and inexpensive machine for forming round bead.

F. L. ROBERTSON

50 RAND STREET BUFFALO, N. Y.

## THEY PAY THEIR WAY!

7

SEVEN — No. 12 SMITH'S CLEAT BENDERS IN ONE SHOP, IS THE ANSWER!

—This shop and many others have found that the mechanic skilled enough to make a perfect seam edge on the end of pipe or fittings with ordinary hand methods, is too valuable for this work!

### A TRIAL SHOULD CONVINCE YOU!

—Your dealer is ready to let you try a No. 12 (twelve inch) or the New No. 16 (eighteen inch) SMITH'S CLEAT BENDER, at no obligation to you. . . . Make an honest comparison between this better way and any method you are now using. Results should prove that you also can make them PAY THEIR WAY.

WRITE FOR NEAREST DEALER  
STOCKING THEM

R. E. SMITH

1521 GARDEN PL. WAUKEGAN, ILL.

### Trademark

## YAGER'S Soldering Salts — Paste

Reg.

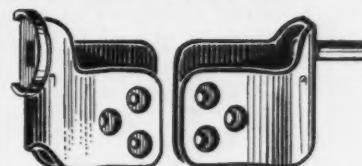
Two standard fluxes for all soft soldering. Safe, quick, certain. Buy them at your jobbers or write us if he cannot supply you.

1/2 lb., 1 lb., 5 lb. cans; 2 oz., 6 oz., 12 oz.

ALEX. R. BENSON CO., INC., HUDSON, N. Y.

## Fossum

### STEEL CLAMP BEARING DAMPER CONTROL



### FOR SPLITTER VOLUME OR ROUND DAMPERS

PAT. NO. 2263080  
OTHER PATENTS PENDING

Self Aligning  
Rattle Proof

No Rivets  
No Screws

M. H. FOSSUM MFG. CO.

1795 ST. CLAIR AVENUE  
ST. PAUL MINNESOTA



### A TIME SAVER DRAW ACTION CHAMPION PIPE CRIMPER

Length—14 Inches.

Weight—one lb. 10 ozs.

Crimps plain round, square and rectangular pipe—quickly, perfectly and easily. Can be used in the shop or carried conveniently in the tool kit to outside jobs. Appreciated by those who install warm air furnace pipe, wall stacks, air ducts, smoke, conductor and water heater vent pipe, etc. Price \$2.50 f. o. b. Factory.

Jobbers and Installers:

Write for full details to-day.

CHAMPION TOOL COMPANY  
376 West 41st Place, Los Angeles, Calif.

## TOOLS for the ROOFING CONTRACTOR

ASBESTOS SHINGLE  
CUTTERS

AXES

BEAMS

BRACKETS

BROOMS

BUCKETS

CALKING GUNS

CALKING CEMENT

DIPPERS

HATCHETS

HOISTS—PORTABLE

HOISTING WHEELS

HOOKS

INSULBRIC

KETTLES

KNIVES

LADDERS

LADDER JACKS

KNOT BRUSHES

MOPS: { JEWEL  
FREY PATENT  
CABLE CORD  
SOFT YARN

MOP BELLS

MOP HANDLES

NAILS, CONCRETE

ROPE

SCRAPERS

SLATERS' TOOLS

TROWELS

WHEELBARROWS

FRANK P. FREY & CO.

2634 W. MADISON STREET

CHICAGO, ILLINOIS



# Defense Savings Pay-Roll Allotment Plan

*Now company heads can help their country, their employees, and themselves*

voluntary  
pay-roll  
allotment  
plan

helps workers provide for the future  
helps build future buying power  
helps defend America today

This is no charity plea. It is a sound business proposition that vitally concerns the present and future welfare of your company, your employees, and yourself.

During the post-war period of readjustment, you may be faced with the unpleasant necessity of turning employees out into a confused and cheerless world. But you, as an employer, can do something *now* to help shape the destinies of your people. Scores of business heads have adopted the Voluntary Pay-roll Allotment Plan as a simple and easy way for every worker in the land to start a *systematic* and *continuous* Defense Bond savings program.

**Many benefits . . . present and future.** It is more than a sensible step toward reducing the ranks of the post-war needy. It will help spread financial participation in National Defense among all of America's wage earners.

The widespread use of this plan will materially retard inflation. It will "store" part of our pyramiding national income that would otherwise be spent as fast as it's earned, increasing the demand for our diminishing supply of consumer goods.

And don't overlook the immediate benefit . . . money for defense materials, quickly, continuously, *willingly*.

**Let's do it the American way!** America's talent for working out emergency problems, democratically, is being tested today. As always, we will work it out, without pressure or coercion . . . in that old American way; each businessman strengthening his *own* house; not waiting for his neighbor to do it. That custom has, throughout history, enabled America to get things done *of its own free will*.

**In emergencies, America doesn't do things "hit-or-miss."** We would get there *eventually* if we just left it to everybody's whim to buy Defense Bonds when they thought of it. But we're a nation of businessmen who understand that the way to get a thing done is to *systematize* the operation. That is why so many employers are getting back of this Voluntary Savings Plan.

Like most efficient systems, it is amazingly simple. All you have to do is offer your employees the convenience of having a fixed sum allotted, from each pay envelope, to the purchase of Defense Bonds. The employer holds these funds in a separate bank account, and delivers a Bond to the employee each time his allotments accumulate to a sufficient amount.

Each employee who chooses to start this savings plan decides for himself the denomination of the Bonds to be purchased and the amount to be allotted from his wages each pay day.

**How big does a company have to be?** From three employees on up. Size has nothing to do with it. It works equally well in stores, schools, publishing houses, factories, or banks. This whole idea of pay-roll allotment has been evolved by businessmen in cooperation with the Treasury Department. Each organization adopts its own simple, efficient application of the idea in accordance with the needs of its own set-up.

**No chore at all.** The system is so simple that A. T. & T. uses exactly the same easy card system that is being used by hundreds of companies having fewer than 25 employees! It is simple enough to be handled by a check-mark on a card each pay day.

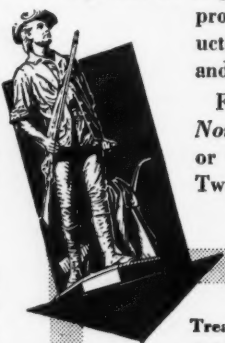
**Plenty of help available.** Although this is *your* plan when you put it into effect, the Treasury Department is ready and willing to give you all kinds of help. Local civilian committees in 48 States are set up to have experienced men work with you just as much as you want them to, and no more.

Truly, about all *you* have to do is to indicate your willingness to get your organization started. We will supply most of the necessary material, and no end of help.

**The first step is to take a closer look.** Sending in the coupon in no way obligates you to install the Plan. It will simply give you a chance to scrutinize the available material and see what other companies are already doing. It will bring you samples of literature explaining the benefits to employees and describing the various denominations of Defense Savings Bonds that can be purchased through the Plan.

Sending the coupon does nothing more than signify that you are anxious to do *something* to help keep your people off relief when defense production sloughs off; *something* to enable *all* wage earners to participate in financing Defense; *something* to provide tomorrow's buying power for your products; *something* to get money *right now* for guns and tanks and planes and ships.

France left it to "hit-or-miss" . . . and *missed*. Now is the time for *you* to act! Mail the coupon or write Treasury Department, Section A, 709 Twelfth St. NW., Washington, D. C.



**FREE - NO OBLIGATION**

Treasury Department, Section A,  
709 Twelfth St. NW., Washington, D. C.

Please send me the free kit of material being used by companies that have installed the Voluntary Defense Savings Pay-Roll Allotment Plan.

Name \_\_\_\_\_

Position \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_



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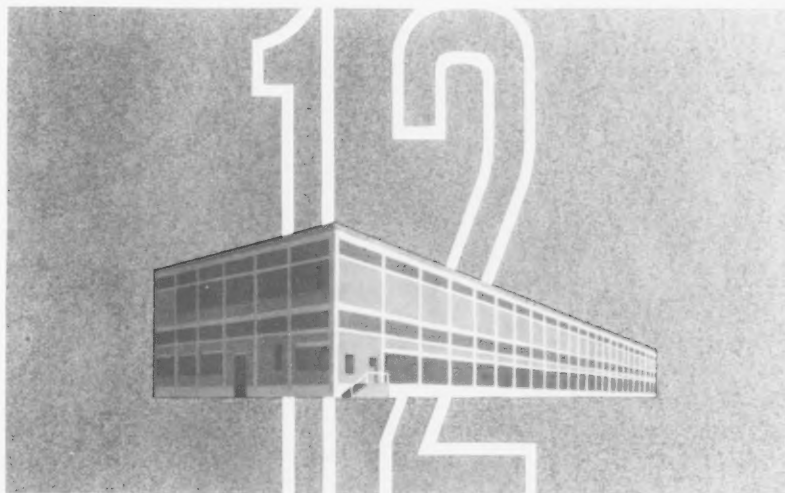
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# Trustworthy

**AND QUALIFIED** A dozen years ago a group of men in DOWAGIAC, Michigan, foresaw an opportunity to render a service to the American family by producing and marketing a dependable, correctly-priced AUTOMATIC HEATING and AIR CONDITIONING UNIT • This was the beginning of the DOWAGIAC STEEL FURNACE COMPANY. Its founders sensed the exact need prevailing in the home, designed their product to fulfill that need, and, imposing severe standards upon their own engineering, began the merchandising of heating equipment the name of which rapidly became a household word for COMFORT, HEALTH, and ECONOMY • Right now the success of the DOWAGIAC STEEL FURNACE COMPANY means much more than the simple success of a business • For many years in America craftsmen and craftsmanship have been edging their skill nearer perfection. It almost seems as if they were destined to fulfill a purpose. The DOWAGIAC STEEL FURNACE COMPANY following sound principles, also grew to a stature of responsibility comparable to other leading enterprises. Finally the test came, and when the Administration called upon the front-line industrial capability of America for the BIG JOB and allotted the tasks incident to our NATIONAL DEFENSE PROGRAM, the DOWAGIAC STEEL FURNACE COMPANY was found TRUSTWORTHY and QUALIFIED, and was lined up for duty. We are pledged to perform — we are proud to perform — and we are doing our part conscientiously. And we know that out of this experience our organization will emerge several degrees higher in capability for the future.

**DOWAGIAC STEEL FURNACE COMPANY, DOWAGIAC, MICHIGAN**

DOWAGIAC



# DOWAGIAC *Mighty Midget*

REPRESENTATIVE OF A COMPLETE LINE OF QUALITY HEATING EQUIPMENT



Let your foresight tell you why, more than ever, it's wise to sell the best. Keenly alert to temperature whims, the complete, compact, Dowagiac Mighty Midget is admirably adapted to the space requirements of the modern home. You can give your customers more for their money because on this particular unit we pay the freight North, South, East or West.

When our dealers interview a customer they have the advantage of a most complete line to offer. Whatever the recommendation, we have a unit to fill that need, whether it be . . . Hand-Fired Steel Furnaces, Oil-Burning Units, Blowers for Air Conditioning, Gas-Burning Units, Stoker Furnaces and Stokers, Oil-Burning Water Heaters, Controls and Accessories.

Our Direct Dealer Plan permits premium quality without premium price. Its use by hundreds of dealers throughout the past several years gives us, we believe, the background to be of valuable assistance to you in the solution of your heating equipment sales. If your results are like those of countless other dealers who have requested and used our Direct Dealer Plan, you will find that there are no limitations to what you can accomplish. ☆ Realizing that it is essential that we keep our prices stabilized we will comply with the Administration's request and not advance our prices.

Anywhere you see it D. S. F. equipment means better heating practice. Representative units of our complete line of heating and air conditioning equipment will be shown in booth 200 at the International Heating & Ventilating Exposition, held in Philadelphia from January 26th through the 30th. The PBA-18 unit, which meets the demand in Defense Housing Construction for more economical equipment, will be shown. It has the approval of P. B. A., U. S. H. A., and other Federal agencies. Night and day production lines give low cost and the unit is available to our dealers under priorities.

DOWAGIAC STEEL FURNACE CO. · DOWAGIAC MICHIGAN







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Section of  
JANUARY, 1942  
**AMERICAN ARTISAN**  
  
**1942**  
**DIRECTORY**

OF WARM AIR HEATING, RESIDENTIAL AIR  
CONDITIONING AND SHEET METAL PRODUCTS

**Section 1.—Products Classified . . . . . Page 228**

If you want to know the names of one or more manufacturers making a certain product, look in Section 1, where products are classified alphabetically in directory style with the noun governing (for instance, Warm Air Furnaces are listed as Furnaces, Warm Air).

**Section 2.—Trade Names . . . . . Page 280**

If you have the trade name of a product and want to know who manufactures it, look in Section 2, where trade names are alphabetically listed. Trade names the same as or identifiable from the company name are not listed. Manufacturers with such trade names can be readily identified under their product classifications in Section 1.

**Section 3.—Manufacturers' Addresses . . . . . Page 295**

For the complete name and address of any manufacturer, look in Section 3.

● The manufacturers whose names are dotted throughout the listings advertise their products in this issue. Turn to Index to Advertisers, page 310, for the page on which you will find the advertising of any of these manufacturers.

## Section of American Artisan

### 1942 DIRECTORY OF WARM AIR HEATING, RESIDENTIAL AIR CONDITIONING AND SHEET METAL PRODUCTS

#### [ Section 1—PRODUCTS CLASSIFIED ]

● The manufacturers whose names are dotted throughout the listings advertise their products in this issue. Turn to Index to Advertisers, page 310, for the page on which you will find the advertising of any of these manufacturers.

#### ADSORBERS, ODOR

Airox Company, New York City. (Odor Neutralizer)  
Betz Corp., Hammond, Ind.  
Carbide & Carbon Chemicals Corp., New York City.  
Connor Engineering Corp., W. B., Dorex Div., New York City.

#### AIR CONDITIONING FURNACES

*See Furnaces, Warm Air, Air Conditioning*

#### AIR CONDITIONING UNITS, CENTRAL PLANT, SUMMER

(Self-contained fan, filter and cooling coil unit for connection to refrigerating compressor or cold water supply with duct distribution of air)

Airtemp Division, Chrysler Corp., Dayton, O.  
Allis-Chalmers Manufacturing Co., Milwaukee, Wis.  
American Blower Corp., Detroit, Mich.  
Baker Ice Machine Co., Inc., Omaha, Nebr.  
Ballantyne Company, Omaha, Nebr.  
Betz Air Conditioning Corp., Kansas City, Mo.  
● Brundage Co., Kalamazoo, Mich.  
Buffalo Forge Co., Buffalo, N. Y.  
Carbondale Division, Worthington Pump & Machinery Corp., Harrison, N. J.  
Carrier Corp., Syracuse, N. Y.  
● Clarage Fan Co., Kalamazoo, Mich.  
Conditionaire Unit Company, Chicago.  
Curtis Refrigerating Machine Co., St. Louis.  
Drayer & Hanson, Inc., Los Angeles, Cal.  
Fairbanks, Morse & Co., Chicago.  
Fedders Mfg. Co., Inc., Buffalo, N. Y.  
Forman Air Conditioning & Eng. Co., New York City, (freon)  
Frigidaire Division, General Motors Sales Corporation, Dayton, O.  
General Air Conditioning Corp., Cincinnati.  
● General Electric Co., Bloomfield, N. J.  
General Refrigeration Division, Yates-American Machine Co., Beloit, Wis.  
Governair Corp., Oklahoma City, Okla.  
Hastings Air Conditioning Company, Inc., Hastings, Nebr.  
Howe Ice Machine Co., Chicago.  
● Ilg Electric Ventilating Co., Chicago.  
Jaden Manufacturing Co., Inc., F., Hastings, Nebr.  
Kauffman Air Conditioning Corp., St. Louis.  
Kennard, Sam, Inc., St. Louis.  
Kramer Trenton Co., Trenton, N. J.  
Lennox Furnace Co., Marshalltown, Ia.  
McCord Radiator & Mfg. Co., Detroit.  
McQuay, Inc., Minneapolis, Minn.  
Marlo Coll Co., St. Louis.  
● Meyer Furnace Co., Peoria, Ill.  
● Michell Air Conditioning Co., Inc., Schenectady, N. Y.  
Modine Mfg. Co., Racine, Wis.  
Niagara Blower Co., New York City.  
Palmer Manufacturing Corp., Phoenix, Ariz.  
Pernot & Rich, Inc., Los Angeles.  
● Premier Furnace Company, Dowagiac, Mich.  
Refrigeration Economics Co., Inc., Canton, O.  
Rempe Co., Chicago.  
Roto-Beam Div., Peerless of America, Inc., Chicago.  
Skinner Heating & Ventilating Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.  
● Sturtevant Co., B. F., Boston.

● Surface Combustion Corp., Toledo, O.  
Trane Co., LaCrosse, Wis.  
● U. S. Air Conditioning Corp., Minneapolis.  
United States Radiator Corp., Detroit.  
Vilter Manufacturing Co., Milwaukee, Wis.  
● Waterman-Waterbury Co., Minneapolis.  
Webster & Co., Warren, Camden, N. J. (Cold Water)  
Westinghouse Electric & Mfg. Co., Springfield, Mass.  
Williams Oil-O-Matic Heating Corp., Bloomington, Ill.  
XL Refrigerating Co., Inc., Chicago.  
York Ice Machinery Corp., York, Pa.  
Young Radiator Co., Racine, Wis.

#### AIR CONDITIONING UNITS, CENTRAL PLANT, WINTER, SPLIT SYSTEM TYPE

(Self-contained fan, filter, humidifier and heating coil unit for connection to steam or hot water boiler with duct distribution of air)

Airtemp Division, Chrysler Corp., Dayton, Ohio.  
Aladdin Heating Corp., Oakland, Cal.  
Allis-Chalmers Manufacturing Company, Milwaukee.  
American Blower Corp., Detroit.  
Betz Air Conditioning Corp., Kansas City, Mo.  
● Brundage Co., Kalamazoo, Mich.  
Buffalo Forge Co., Buffalo, N. Y.  
Carbondale Division, Worthington Pump & Machinery Corp., Harrison, N. J.  
Carrier Corp., Syracuse, N. Y.  
● Clarage Fan Co., Kalamazoo, Mich.  
Curtis Refrigerating Machine Co., St. Louis.  
Eastern Oil & Equipment Co., Portland, Maine.  
Fairbanks, Morse & Co., Chicago.  
Fedders Mfg. Co., Inc., Buffalo.  
● Fitzgibbons Boiler Co., Inc., New York City.  
● General Electric Co., Bloomfield, N. J.  
Handelan Washed Air Company, Minneapolis.  
Hastings Air Conditioning Co., Inc., Hastings, Nebr.  
Jaden Manufacturing Co., Inc., F., Hastings, Nebr.  
Johnson Co., S. T., Oakland, Cal., and Philadelphia  
Kauffman Air Conditioning Corp., St. Louis.  
Kennard, Inc., Sam, St. Louis.  
McQuay, Inc., Minneapolis.  
Marlo Coll Company, St. Louis.  
May Oil Burner Corp., Baltimore.  
● Mayflower Air Conditioners, Inc., St. Paul.  
Michell Air Conditioning Co., Inc., Schenectady, N. Y.  
Modine Mfg. Co., Racine, Wis.  
New York Blower Co., Chicago.  
Pan-American Eng. Co., Berkeley, Cal.  
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.  
Refrigeration Economics Co., Inc., Canton, O.  
Richmond Radiator Co., Inc., Uniontown, Pa.  
Roto-Beam Div., Peerless of America, Inc., Chicago.  
Skinner Htg. & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.  
● Surface Combustion Corp., Toledo, O.  
Trane Co., LaCrosse, Wis.  
● U. S. Air Conditioning Corp., Minneapolis.  
United States Radiator Corp., Detroit.  
● Waterman-Waterbury Co., Minneapolis.  
Western Blower Company, Seattle, Wash.  
Webster & Co., Warren, Camden, N. J.  
Westinghouse Electric & Mfg. Co., Springfield, Mass.  
Williams Oil-O-Matic Heating Corporation, Bloomington, Ill.  
Wood Industries, Inc., Gar, Detroit.  
York Ice Machinery Corporation, York, Pa.  
York Oil Burner Company, Inc., York, Pa.  
Young Radiator Company, Racine, Wis.

● Advertisement in this issue. See Index to Advertisers, page 310

## AIR CONDITIONING UNITS, EVAPORATIVE TYPE, SUMMER

(For cooling with sprays, no dehumidification)

- Air Equipment Co., Denver, Colo.
- Air-O-Line Co., The, Dallas, Tex.
- Air & Refrigeration Corp., New York City.
- Alter Co., Harry, Chicago.
- American Blower Corporation, Detroit.
- American Metal Products, Fort Worth, Texas.
- American Cooling Tower Co., Kansas City, Mo.
- Aqua-Mist Company, Topeka, Kansas.
- Atlas Heating & Ventilating Co., Ltd., San Francisco, Cal.
- Ballantyne Company, Omaha, Nebr.
- Blen Air Conditioning Co., Los Angeles, Cal.
- Campbell Heating Co., E. K., Kansas City, Mo.
- Coolmaster Corp., Chicago.
- Dallas Engineering Co., Inc., Dallas, Tex.
- Economy Electric Manufacturing Co., Cicero, Ill.
- Electrogas Furnace Company, San Francisco, Cal.
- Essick Manufacturing Co., Los Angeles, Cal.
- Fairbanks, Morse & Co., Chicago.
- Great National Air Conditioning Corp., Dallas, Tex.
- Hall Mfg. Co., Cedar Rapids, Ia.
- Hammond Aircraft Corp., South San Francisco, Cal.
- Little Giant Vaporizer Co., Oklahoma City, Okla. (Vaporizers)
- Montag Stove & Furnace Works, Portland, Ore.
- Mountain States Equipment Co., Denver, Colo.
- Niagara Blower Company, New York City.
- Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
- Northwest Stove Works, Portland, Ore.
- Pacific Gas Radiator Co., Huntington Park, Cal.
- Palmer Manufacturing Corp., Phoenix, Ariz.
- Payne Furnace & Supply Co., Beverly Hills, Cal.
- Pernot & Rich, Inc., Los Angeles.
- Reynolds Manufacturing Co., Springfield, Mo.
- Royal Air Conditioning Equipment, Alhambra, Cal.
- Shreveport Eng. Co., Inc., Shreveport, La.
- Spray Wheel Air Conditioners, Inc., Denver, Colo.
- Todd Air Conditioning Co., Inc., Bonner Springs, Kansas.
- U. S. Air Conditioning Corp., Minneapolis, Minn.
- Utility Fan Corporation, Los Angeles, Cal.
- Western Blower Company, Seattle, Wash.
- X L Refrigerating Co., Inc., Chicago.

## AIR CONDITIONING UNITS, ROOM TYPE, SUMMER, FLOOR CABINET, REMOTE COMPRESSOR OR COLD WATER, UNDER 3 TONS CAPACITY

(Self-contained blower, coil, filter unit for connection to remote compressor or cold water supply)

- Airgard Manufacturing Co., Chicago.
- Airtemp Division, Chrysler Corp., Dayton, Ohio.
- Carrier Corp., Syracuse, N. Y.
- Dunham Co., C. A., Chicago.
- Fairbanks, Morse & Co., Chicago.
- Frigidaire Division, General Motors Sales Corporation, Dayton, O.
- General Air Conditioning Corp., Cincinnati, Ohio.
- General Electric Co., Bloomfield, N. J.
- Giant Mfg. Co., Council Bluffs, Iowa.
- Hall Manufacturing Co., Cedar Rapids, Iowa.
- Hastings Air Conditioning Co., Inc., Hastings, Nebr.
- Ilg Electric Ventilating Co., Chicago.
- Jaden Mfg. Co., Inc., F., Hastings, Nebr.
- Kauffman Air Conditioning Corp., St. Louis.
- Kennard, Inc., Sam, St. Louis.
- King Ventilating Co., Owatonna, Minn.
- McLouth Air Conditioning Corporation, Lansing, Mich.
- McQuay, Inc., Minneapolis.
- Nesbitt, Inc., John J., Philadelphia.
- Norwin Co., Freeport, Ill.
- Perham Products, Inc., Chicago.
- Premier Furnace Company, Dowagiac, Mich.
- Refrigeration Economics Co., Inc., Canton, O.
- Roto-Beam Div., Peerless of America, Inc., Chicago.
- Scott-Newcomb, Inc., St. Louis.
- Standard Computing Scale Co., Air Conditioning & Refrigeration Div., Detroit.
- Trane Company, LaCrosse, Wis.
- Unified Air Conditioner Co., Duluth, Minn.
- U. S. Air Conditioning Corp., Minneapolis.
- Westinghouse Electric & Manufacturing Company, Springfield, Mass.
- X L Refrigerating Company, Inc., Chicago.
- York Ice Machinery Corp., York, Pa.
- Young Radiator Company, Racine, Wis.

## AIR CONDITIONING UNITS, ROOM TYPE, SUMMER, FLOOR CABINET, SELF-CONTAINED COMPRESSOR, UNDER 3 H. P.

(Self-contained blower, coils, compressor and filter unit)

- Airmode Manufacturing Co., Chicago.
- Airtemp Div., Chrysler Corp., Dayton, O.

- Carbondale Div., Worthington Pump & Machinery Corp., Harrison, N. J.
- Carrier Corp., Syracuse, N. Y.
- Certified Products Company, Toledo. (Window-Sill Mounted)
- Fairbanks, Morse & Co., Chicago.
- Frigidaire Division, General Motors Sales Corporation, Dayton, O.
- Gale Products, Galesburg, Ill.
- General Electric Co., Bloomfield, N. J.
- General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
- Governair Corporation, Oklahoma City, Okla.
- Harvey-Whipple, Inc., Springfield, Mass.
- Ice Cooling Appliance Corp., Morrison, Ill. (Ice)
- Ilg Electric Ventilating Co., Chicago.
- Indian Trailer Corporation, Koolroom Div., Chicago.
- Kauffman Air Conditioning Corp., St. Louis.
- Meyer Furnace Co., Peoria, Ill.
- Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit.
- Philco Radio & Television Corp., Philadelphia.
- Pleasantaire Corp., Washington, D. C.
- Premier Furnace Company, Dowagiac, Mich.
- Refrigeration Economics Co., Inc., Canton, Ohio.
- Roto-Beam Div., Peerless of America, Inc., Chicago.
- Scott-Newcomb, Inc., St. Louis.
- Trane Co., LaCrosse, Wis.
- Westinghouse Electric & Manufacturing Co., Springfield, Mass.
- York Ice Machinery Corp., York, Pa.

## AIR CONDITIONING UNITS, ROOM TYPE, WINTER, FLOOR CABINET

(Self-contained blower, filter, heating coil, humidifier unit)

- Air & Refrigeration Corp., New York City.
- Burnham Boiler Corp., Irvington, N. Y.
- Campbell Heating Company, Des Moines, Ia.
- Carrier Corp., Syracuse, N. Y.
- Clarage Fan Co., Kalamazoo, Mich.
- Drayer & Hanson, Inc., Los Angeles.
- Dunham Co., C. A., Chicago, Ill.
- Fairbanks, Morse & Co., Chicago, Ill.
- Frigidaire Division, General Motors Sales Corporation, Dayton, O.
- General Electric Co., Bloomfield, N. J.
- Ilg Electric Ventilating Co., Chicago, Ill.
- Kauffman Air Conditioning Corp., St. Louis, Mo.
- Kennard, Inc., Sam, St. Louis.
- McQuay, Inc., Minneapolis, Minn.
- Nesbitt, Inc., John J., Philadelphia.
- Pan-American Engineering Co., Berkeley, Cal.
- Perham Products, Inc., Chicago.
- Refrigeration Economics Co., Inc., Canton, Ohio.
- Reznor Mfg. Co., Mercer, Pa.
- Richmond Radiator Company, Inc., Uniontown, Pa.
- Roto-Beam Div., Peerless of America, Inc., Chicago.
- Somers, Inc., H. J., Detroit, Mich.
- Standard Computing Scale Co., Air Conditioning and Refrigeration Div. Detroit.
- Surface Combustion Corp., Toledo, O.
- Trane Co., LaCrosse, Wis.
- Unified Air Conditioner Co., Duluth, Minn.
- U. S. Air Conditioning Corp., Minneapolis.
- Westinghouse Electric & Mfg. Co., Springfield, Mass.
- York Ice Machinery Corp., York, Pa.
- Young Radiator Co., Racine, Wis.

## AIR CONDITIONING UNITS, ROOM TYPE, YEAR AROUND, FLOOR CABINET

(Self-Contained blower, cooling and heating coil, filter, humidifier unit for connection to remote compressor or cold water supply and steam or hot water)

- Air & Refrigeration Corp., New York City.
- Airtemp Division, Chrysler Corp., Dayton, Ohio.
- Baker Ice Machine Co., Inc., Omaha, Nebr.
- Beacon-Morris Corp., Boston.
- Betz Air Conditioning Corp., Kansas City, Mo.
- Carbondale Division, Worthington Pump & Machinery Corp., Harrison, N. J.
- Carrier Corp., Syracuse, N. Y.
- Clarage Fan Co., Kalamazoo, Mich.
- Curtis Refrigerating Machine Co., St. Louis.
- Dunham Co., C. A., Chicago.
- Fairbanks, Morse & Co., Chicago, Ill.
- Frigidaire Division, General Motors Sales Corporation, Dayton, O.
- General Electric Co., Bloomfield, N. J.
- General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
- Grinnell Co., Inc., Providence, R. I.
- Hastings Air Conditioning Company, Inc., Hastings, Nebr.
- Ilg Electric Ventilating Co., Chicago, Ill.
- Jaden Manufacturing Co., Inc., F., Hastings, Nebr.
- Kauffman Air Conditioning Corp., St. Louis, Mo.
- Kennard, Inc., Sam, St. Louis.
- Kramer Trenton Co., Trenton, N. J.

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McQuay, Inc., Minneapolis, Minn.  
 Modine Mfg. Co., Racine, Wis.  
 Nesbitt, Inc., John J., Philadelphia.  
 Perham Products, Inc., Chicago.  
 Refrigeration Economics Co., Inc., Canton, Ohio.  
 Roto-Beam Div., Peerless of America, Inc., Chicago.  
 Semco Mfg. Co., Nashville, Tenn.  
 Standard Computing Scale Co., Air Conditioning and Refrigeration Div., Detroit.  
 Tenney Engineering, Inc., Bloomfield, N. J.  
 Trane Co., La Crosse, Wis.  
 Unified Air Conditioner Co., Duluth, Minn.  
 Westinghouse Electric & Manufacturing Co., Springfield, Mass.  
 York Ice Machinery Corp., York, Pa.  
 Young Radiator Co., Racine, Wis.

## AIR CONDITIONING UNITS, STORE TYPE, SUMMER, FLOOR CABINET, SELF-CONTAINED COMPRESSOR, 3 H. P. AND OVER

(Self-contained blower, coil, compressor, filter unit, with air discharge approximately 6 ft. above floor)

Airtemp Division, Chrysler Corp., Dayton, O.  
 Baker Ice Machine Co., Inc., Omaha, Neb.  
 Buffalo Forge Co., Buffalo, N. Y.  
 Carbondale Division, Worthington Pump & Machinery Corporation, Harrison, N. J.  
 Carrier Corp., Syracuse, N. Y.  
 •Clarage Fan Co., Kalamazoo, Mich.  
 Curtis Refrigerating Machine Co., St. Louis.  
 Fairbanks, Morse & Co., Chicago.  
 Forman Air Conditioning & Eng. Co., New York City. (freon)  
 Frick Co., Waynesboro, Pa.  
 Frigidaire Division, General Motors Sales Corporation, Dayton, O.  
 •General Electric Co., Air Conditioning Dept., Bloomfield, N. J.  
 General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.  
 Kauffman Air Conditioning Corp., St. Louis.  
 Nevinger Mfg. Co., Greenfield, Ill.  
 Refrigeration Economics Co., Inc., Canton, O.  
 Roto-Beam Div., Peerless of America, Inc., Chicago.  
 Scott-Newcomb, Inc., St. Louis, Mo.  
 Trane Co., LaCrosse, Wis.  
 Vilter Mfg. Company, Milwaukee.  
 Westinghouse Electric & Mfg. Co., Springfield, Mass.  
 Williams Oil-O-Matic Heating Corporation, Bloomington, Ill.  
 X-L Refrigerating Company, Inc., Chicago.  
 York Ice Machinery Corp., York, Pa.

## AIR DIFFUSERS

*See Diffusers, Air*

## AIR FILTERS

*See Filters, Air*

## AIR METERS

*See Meters, Air Velocity, Direct Reading*

## AIR WASHERS

*See Washers, Air*

## ANALYZERS, CO<sub>2</sub>, PORTABLE

Bacharach Industrial Instrument Co., Pittsburgh, Pa.  
 Barclay, Inc., Robert, Chicago.  
 Defender Automatic Regulator Co., St. Louis.  
 Dwyer Mfg. Co., F. W., Chicago.  
 Ellison Draft Gage Co., Chicago, Ill.  
 Engelhard, Inc., Chas., Newark, N. J.  
 Friez & Sons, Julien P., Div., Bendix Aviation Corp., Baltimore.  
 Hays Corp., Michigan City, Ind.  
 Hotstream Heater Co., Cleveland.  
 Huyette Co., Inc., Paul B., Philadelphia.  
 Permutit Co., New York City.  
 Precision Control Co., San Francisco.  
 Precision Thermometer & Instrument Co., Philadelphia.  
 Preferred Utilities Mfg. Corp., New York City.  
 Service to Industry, West Hartford, Conn.  
 Weaver Mfg. Co., Springfield, Ill.  
 Westinghouse Electric & Mfg. Co., Springfield, Mass.

## ANEMOMETERS

American Instrument Co., Silver Spring, Md.  
 Barclay, Inc., Robert, Chicago.  
 Bristol Co., Waterbury, Conn.  
 Detroit Air Conditioning Service Co., Inc., Detroit.  
 Friez & Sons, Julien P., Corp., Div. Bendix Aviation, Baltimore, Md.  
 Hill Co., E. Vernon, Chicago Ill.

•Illinois Testing Laboratories, Inc., Chicago, Ill.  
 Taylor Instrument Companies, Rochester, N. Y.  
 Wilson Products, Inc., Reading, Pa. (Thermometer)

## ANGLES, BARS, BEAMS, CHANNELS AND TEES (LIGHT WEIGHT SHAPES)

Aluminum Company of America, Pittsburgh, Pa.  
 •American Brass Co., Waterbury, Conn.  
 Atlantic Steel Company, Atlanta, Ga.  
 •Bethlehem Steel Co., Bethlehem, Pa.  
 Brasco Manufacturing Co., Harvey, Ill.  
 Byers Co., A. M., Pittsburgh, Pa. (Wrought iron structural shapes).  
 Carnegie-Illinois Steel Corp., Pittsburgh, Pa.  
 Chase Brass & Copper Co., Incorporated, Waterbury, Conn.  
 Colonial Alloys Co., Philadelphia.  
 Columbia Steel Co., San Francisco, Cal.  
 Decatur Iron & Steel Company, Decatur, Ala.  
 Inland Steel Co., Chicago, Ill.  
 International Steel Co., Evansville, Ind.  
 Jones & Laughlin Steel Corp., Pittsburgh, Pa.  
 Laclede Steel Co., St. Louis, Mo.  
 Lukens Steel Co., Coatesville, Pa.  
 •Milcor Steel Co., Milwaukee, Wis.  
 •Republic Steel Corp., Cleveland, O.  
 Revere Copper and Brass Incorporated, New York City.  
 Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.  
 Truscon Steel Co., Youngstown, O.  
 Weirton Steel Co., Weirton, W. Va.  
 Youngstown Sheet & Tube Co., Youngstown, O.

## ARC WELDERS

*See Welders, Arc*

## ARC WELDING ELECTRODES

*See Electrodes, Arc Welding*

## ASBESTOS BOARD

*See Board, Duct, Asbestos*

## ASBESTOS PAPER

*See Paper, Asbestos*

## ATTIC FANS

*See Fans, Night Air Cooling*

## ATTIC FURNACES

*See Furnaces, Warm Air, Air Conditioning for Attic Installation*

## AUTOMATIC HUMIDIFIERS

*See Humidifiers, Furnace, Evaporation, Spray*

## BAFFLES, OIL BURNER & STOKER

Air Devices, Inc., New York City.  
 Barclay Inc., Robert, Chicago.  
 Harvey, Inc., Sid, Valley Stream, N. Y.  
 Jones Products Company, Ferndale, Mich.  
 •McLeod & Henry Co., Inc., Troy, N. Y.  
 Monogram Combustion Chamber Co., Philadelphia.  
 Munn and Steele, Inc., Newark, N. J.  
 Refractory & Insulation Corp., New York City.

## BALL BEARINGS

*See Bearings, Ball*

## BAND SAWS

*See Saws, Band, Sheet Metal Cutting*

## BAR FOLDERS

*See Machines, Bar Folders*

## BARS

*See Angles, Bars, Beams, Channels and Tees (Light Weight Shapes)*

## BASES AND PADS, VIBRATION ISOLATING

Armstrong Cork Co., Lancaster, Pa. (Cork)  
 Buffalo Forge Co., Buffalo, N. Y.  
 Butterworth, B. T., Jr., New Canaan, Conn.  
 •Clarage Fan Co., Kalamazoo, Mich.  
 Cork Import Corp., New York City (Cork)  
 Cork Insulation Co., Inc., New York City.  
 Ehret Magnesia Manufacturing Co., Valley Forge, Pa.  
 Felters Co., Inc., Boston.  
 Firestone Tire & Rubber Co., Akron, O.  
 Gates Rubber Company Sales Div., Inc., Denver, Colo.  
 Keldur Corporation, New York City.  
 Korfund Co., Inc., Long Island City, N. Y.  
 Lord Mfg. Co., Erie, Pa.  
 Manley Products Corp., York, Pa.  
 Mundet Cork Corp., Brooklyn, N. Y.  
 National Lead Co., New York City.  
 United Cork Companies, Kearny, N. J.  
 United States Rubber Co., New York City.

Vibration Eliminator Co., Astoria, N. Y. (Cork and rubber)  
Western Felt Works, Chicago (Felt)

### BATHS, TINNING

American Gas Furnace Co., Elizabeth, N. J.  
Retinning Manufacturing Co., Chicago.

### BEADERS

*See Machines, Beading*

### BEAMS

*See Angles, Bars, Beams, Channels and Tees (Light weight Shapes)*

### BEARINGS, BALL

Ahlberg Bearing Co., Chicago.  
Bantam Bearings Corp., South Bend, Ind.  
Bearing Co. of America, Lancaster, Pa.  
Dodge Mfg. Corp., Mishawaka, Ind.  
Fafnir Bearing Co., New Britain, Conn.  
Link-Belt Co., Chicago.  
Marlin-Rockwell, Jamestown, N. Y.  
New Departure, Div. General Motors Sales Corp., Bristol, Conn.  
Nice Ball Bearing Co., Philadelphia.  
Norma-Hoffman Bearings Corp., Stamford, Conn.  
Schatz Mfg. Co., Poughkeepsie, N. Y.  
Shafer Bearing Corp., Chicago.  
SKF Industries, Inc., Philadelphia.  
Stephens-Adamson Mfg. Co., Aurora, Ill.  
Torrington Mfg. Co., Torrington, Conn.  
Wood's Sons Co., T. B., Chambersburg, Pa.

### BEARINGS, PILLOW BLOCK

Ahlberg Bearing Co., Chicago.  
Air Controls, Inc., Cleveland.  
Caldwell Co., W. E., Louisville, Ky.  
Central Die Casting & Mfg. Co., Inc., Chicago.  
Chain Belt Co., Milwaukee, Wis.  
Chicago Die Casting Co., Chicago.  
Clizbe Bros. Mfg. Co., Plymouth, Ind.  
Dick Co., Inc., R. & J., Passaic, N. J.  
Dodge Mfg. Corp., Mishawaka, Ind.  
Fafnir Bearing Co., New Britain, Conn.  
Freed Products Co., Moline, Ill.  
General Motors Corp., Moraine Products Div., Dayton, Ohio.  
Goldens' Fdry. & Machine Co., Columbus, Ga.  
Hastings Air Conditioning Company, Inc., Hastings, Nebr.  
Jones Foundry & Machine Co., W. A., Chicago.  
●Lau Blower Co., Dayton, Ohio.  
Link-Belt Co., Chicago.  
●Maple City Stamping Co., Peoria, Ill.  
Medart Co., St. Louis.  
Norma-Hoffmann Bearing Corp., Stamford, Conn.  
●Randall Graphite Products Corp., Chicago.  
Royersford Foundry & Machine Co., Royersford, Pa.  
●Schwitzer-Cummins Co., Indianapolis, Ind.  
Shafer Bearing Corp., Chicago.  
SKF Industries, Inc., Philadelphia.  
Smith, Inc., Winfield H., Springfield, N. Y.  
Sprout-Waldron Co., Muncy, Pa.  
Standard Pressed Steel Co., Jenkintown, Pa.  
Stephens-Adamson Mfg. Co., Aurora, Ill.  
●Triangle Manufacturing Co., Oshkosh, Wis.  
Viking Air Conditioning Corp., Cleveland.  
Wood's Sons Co., T. B., Chambersburg, Pa.

### BEARINGS, ROLLER

Ahlberg Bearing Company, Chicago.  
Bantam Bearings Corp., South Bend, Ind.  
Dodge Mfg. Corp., Mishawaka, Ind.  
Hyatt Bearings Div., General Motors Sales Corp., Harrison, N. J.  
Jones Foundry & Machine Co., W. A., Chicago.  
Link-Belt Co., Chicago.  
Medart Co., St. Louis.  
Norma-Hoffmann Bearings Corp., Stamford, Conn.  
Roller Bearing Co. of America, Trenton, N. J.  
Royersford Foundry & Machine Co., Royersford, Pa.  
Shafer Bearing Corp., Chicago.  
SKF Industries, Inc., Philadelphia.  
Timken Roller Bearing Co., Canton, Ohio.  
Torrington Mfg. Co., Torrington, Conn.  
Wood's Sons Co., T. B., Chambersburg, Pa.

### BEARINGS, SLEEVE

Dodge Mfg. Corp., Mishawaka, Ind.  
Federal-Mogul Corp., Detroit, Mich.  
General Motors Corp. Moraine Products Div., Dayton, Ohio.  
Johnson Bronze Co., New Castle, Pa.  
Keystone-Carbon Co., Inc., St. Marys, Pa.  
Medart Co., St. Louis.  
Motex Metal Process Corporation, Detroit.  
●Randall Graphite Products Co., Chicago, Ill.  
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.  
Wood's Sons Co., T. B., Chambersburg, Pa.

### BELTS, V

Allis-Chalmers Mfg. Co., Milwaukee, Wis.  
American Pulley Co., Philadelphia.

Browning Mfg. Co., Inc., Maysville, Ky.  
Chicago Belting Co., Chicago.  
Continental Rubber Works, Erie, Pa.  
Dayton Rubber Mfg. Co., Dayton, O.  
Dick Co., Inc., R. & J., Passaic, N. J.  
Dodge Manufacturing Corp., Mishawaka, Ind.  
Firestone Tire & Rubber Co., Akron, Ohio.  
Gates Rubber Co., Denver, Colo.  
Gilmer Co., L. H., Philadelphia, Pa.  
Goodrich Co., B. F., Akron, O.  
Goodyear Tire & Rubber Co., Akron, O.  
Jones Foundry & Machine Co., W. A., Chicago.  
Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J.  
Manheim Manufacturing and Belting Company, Manheim, Pa. (Adjustable)  
Medart Co., St. Louis.  
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O.  
Rockwood Mfg. Co., Indianapolis, Ind.  
Schlerson Co., Chas. A., New York City.  
Thermoid Rubber Div. of Thermoid Co., Trenton, N. J.  
United States Rubber Co., New York City.  
Wood's Sons Co., T. B., Chambersburg, Pa.  
Worthington Pump & Machinery Corp., Harrison, N. J.

### BENDERS, ANGLE, ETC.

Champion Blower & Forge Co., Lancaster, Pa.  
Excelsior Tool and Machine Co., East St. Louis, Ill.  
Hendley & Whittemore Co., Beloit, Wis.  
Hossfield Mfg. Co., Winona, Minn.  
O'Neill-Irwin Mfg. Co., Minneapolis.  
●Whitney Metal Tool Company, Rockford, Ill.

### BI-METALS, THERMOSTATIC

Chace Co., W. M., Detroit, Mich.  
General Plate Div. Metals & Controls Corp., Attleboro, Mass.  
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.  
Wilson Co., The, H. A., Newark, N. J.

### BLADES, PROPELLER FAN

●Ackermann Manufacturing Company, Wheeling, W. Va.  
Aerovent Fan Co., Piqua, Ohio.  
Air Controls, Inc., Cleveland.  
Aire-Foile Fan & Blower Co., Detroit, Mich.  
Airmaster Corp., Chicago, Ill.  
●Allen Corp., Detroit.  
Autovent Fan & Blower Div., Herman Nelson Corporation, Chicago.  
Belanger Fan & Blower Co., Detroit.  
Champion Blower & Forge Co., Lancaster, Pa.  
Chelsea Fan & Blower Co., Inc., Irvington, N. J.  
Circulators & Devices Mfg. Corp., New York City.  
Dallas Engineering Co., Inc., Dallas, Texas.  
DeBothezat Vent. Eq. Div., American Machine & Metals, Inc., East Moline, Ill.  
Dual-Air Fan Corporation, Chicago.  
Economy Electric Manufacturing Co., Cicero, Ill.  
Electrovent Fan & Mfg. Co., Chicago, Ill.  
General Aire Company, Philadelphia.  
International Engineering, Inc., Dayton, Ohio.  
Lohman, Inc. William J., Irvington, N. J.  
Meier Electric & Machine Co., Indianapolis, Ind.  
Myers Electric Co., Pittsburgh, Pa.  
Norwin Co., Freeport, Ill.  
Peerless Electric Co., Warren, O.  
Roto-Beam Div., Peerless of America, Chicago.  
●Schwitzer-Cummins Company, Indianapolis, Ind.  
South Bend Air Products, Inc., South Bend, Ind.  
●Sturtevant Co., B. F., Hyde Park, Boston, Mass.  
Swift Mfg Co., Detroit, Mich.  
Torrington Mfg. Co., Torrington, Conn.  
●Utility Fan Corporation, Los Angeles.  
●Victor Electric Products, Inc., Cincinnati, O.

### BLAST GATES

Airtherm Mfg. Co., St. Louis, Mo.  
Allington & Curtis Mfg. Co., Saginaw, Mich.  
●Berger Bros. Co., Philadelphia, Pa.  
Blower Application Co., Milwaukee, Wis.  
Buffalo Forge Co., Buffalo, N. Y.  
Champion Blower & Forge Co., Lancaster, Pa.  
●Clarage Fan Co., Kalamazoo, Mich.  
Day Co., The, Minneapolis.  
Goethel Co., Alfred C., Milwaukee, Wis.  
Goethel Sheet Metal Works, Alfred, Milwaukee, Wis.  
Grand Rapids Blow Pipe and Dust Arrester Co., Grand Rapids, Mich.  
Kirk & Blum Mfg. Co., Cincinnati, O.  
Maysteel Products, Inc., Mayville, Wis.  
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.  
R-S Products Corp., Philadelphia, Pa.  
Spencer Turbine Co., Hartford, Conn.  
●Sturtevant Co., B. F., Hyde Park, Boston, Mass.  
Western Blower Co., Seattle, Wash.

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## BLINDS, VENETIAN

Athey Co., Chicago.  
Bostwick-Goodell Co., Norwalk, Ohio.  
Chain Tape Venetian Blind Co., Chicago.  
Chicago Venetian Blind Co., Chicago.  
Columbia Mills, Inc., Saginaw, Mich.  
Higgin Products, Inc., Newport, Ky.  
Hough Shade Corporation, Janesville, Wis.  
Kane Mfg. Corporation, Kane, Pa.  
Miller-Connell Mfg. Co., Inc., Chicago.  
Mitchell Moulding Co., Forest Park, Ill.  
Patterson Shade Co., Indianapolis, Ind.  
Russell Company, F. C., Cleveland.  
Schatz Venetian Blinds, Los Angeles.  
Snead, Herbert S., New York City.  
Standard Products Co., Detroit.  
Swedish Venetian Blind Co., New York City.  
Warren Shade Co., Inc., Minneapolis, Minn.  
Western Venetian Blind Co., New York City.  
Yardley Venetian Blind Co., Columbus, Ohio.

## BLOWER—FILTER UNITS

(Separate Conversion Units for Warm Air Furnaces)

Agricola Furnace Co., Inc., Gadsden, Ala.  
Air Conditioning Equipment Co., Minneapolis, Minn.  
Air Controls, Inc., Cleveland, O.  
Airwasher Corporation, Lansing, Mich.  
American Foundry & Furnace Co., Bloomington, Ill.  
American Furnace Co., St. Louis, Mo.  
American Furnace & Foundry Co., Milan, Mich.  
● American Radiator and Standard Sanitary Corp., Pittsburgh.  
Armstrong Furnace Company, Columbus, Ohio.  
Atlas Heating & Ventilating Co., Ltd., San Francisco, Cal.  
Auburn Burner Company, Auburn, Ind.  
Baker Furnace & Cleaner Mfg. Co., Toledo, O.  
● Bard Mfg. Co., Bryan, O.  
Barrett Engineers, Cleveland Heights, O.  
Bishop & Babcock Mfg. Co., Cleveland, O.  
Bovee Furnace Works, Waterloo, Iowa.  
● Brundage Co., Kalamazoo, Mich.  
Bryant Corp., C. L., Cleveland.  
Campbell Heating Co., Des Moines, Ia.  
Char-Gale Mfg. Co., Minneapolis.  
Cleveland Steel Products Corp., Toridheet Div., Cleveland.  
● Conco Corporation, Mendota, Ill.  
● Dowagiac Steel Furnace Company, Dowagiac, Mich.  
Economy Baler Co., Ann Arbor, Mich.  
Economy Electric Mfg. Co., Cicero, Ill.  
● Forest City Foundries Co., Cleveland.  
● Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.  
Furblo Co., Hermansville, Mich.  
Gehrl Co., Tacoma, Wash.  
General Blower Corp., San Francisco.  
Gilbert & Barker Mfg. Co., Springfield, Mass.  
Green Colonial Furnace Company, Des Moines, Iowa.  
Hall Manufacturing Co., Cedar Rapids, Iowa.  
● Hall-Neal Furnace Co., Indianapolis, Ind.  
Harvey-Whipple, Inc., Springfield, Mass.  
Hastings Air Conditioning Company, Inc., Hastings, Nebr.  
● Henry Furnace & Foundry Co., Cleveland, O.  
● Hess Warming & Ventilating Co., Chicago, Ill.  
● Homer Furnace & Foundry Corp., Coldwater, Mich.  
Jaden Mfg. Co., Inc., F., Hastings, Nebr.  
Kelsey Heating Co., Syracuse, N. Y.  
● Lau Blower Co., Dayton, O.  
Lennox Furnace Co., Marshalltown, Ia.  
McLouth Air Conditioning Corp., Lansing, Mich.  
Majestic Co., Huntington, Ind.  
MaGill Foundry & Furnace Works, P. H., Bloomington, Ill.  
● Maple City Stamping Co., Peoria, Ill.  
Marshall Furnace Co., Marshall, Mich.  
● Meyer Furnace Co., Peoria, Ill.  
ModernAire Co., Div. Des Moines Stove Repair Co., Des Moines, Ia.  
Montag Stove & Furnace Works, Portland, Ore.  
● Mueller Furnace Co., L. J., Milwaukee, Wis.  
National Manufacturing & Engineering Co., Detroit.  
New-Aire Blower Co., Dearborn, Mich.  
Northwest Stove & Furnace Works, Inc., Portland, Ore.  
● Olsen Mfg. Co., C. A., Elyria, O.  
● Pacific Gas Radiator Co., Huntington Park, Cal.  
● Patten Company, J. V., Sycamore, Ill.  
● Payne Furnace & Supply Co., Beverly Hills, Cal.  
Peerless Electric Co., Warren, O.  
● Peerless Foundry Co., Indianapolis, Ind.  
Pennsylvania Furnace & Iron Co., Warren, Pa.  
● Premier Furnace Co., Dowagiac, Mich.  
● Roberts-Hamilton Co., Minneapolis, Minn.  
● Round Oak Co., Dowagiac, Mich.  
● Royal Air Conditioning Equip. Co., Alhambra, Cal.  
Rudy Furnace Co., Dowagiac, Mich.  
● Rybolt Heater Company, Ashland, Ohio.  
● St. Louis Furnace Mfg. Co., St. Louis.  
Sandberg Co., H. J., Portland, Ore.  
Schwab Furnace Co., Milwaukee, Wis.  
● Schwitzer-Cummins Co., Indianapolis, Ind.  
Sioux City Foundry and Boiler Co., Sioux City, Ia.

Skinner Htg. & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.  
Spray Wheel Air Conditioners, Inc., Denver, Colo.  
Todd Air Conditioning Co., Inc., Bonner Springs, Kan.  
● U. S. Air Conditioning Corp., Minneapolis.  
● Utility Fan Corporation, Los Angeles.  
Viking Air Conditioning Corp., Cleveland, O.  
● Waterman-Waterbury Co., Minneapolis, Minn.  
Wayne Automatic Relay Co., Fort Wayne, Ind.  
Western Blower Co., Seattle, Wash.  
Westinghouse Electric & Mfg. Co., Springfield, Mass.  
● Williamson Heater Co., Cincinnati, O.

## BLOWER HOUSINGS

See Housings, Blower

## BLOWER—WASHER UNITS, FOR CLEANING OR HUMIDIFYING

(Separate Conversion Units for Warm Air Furnaces)

Air Stream Filter Corp., St. Louis.  
Airwasher Corporation, Lansing, Mich.  
American Blower Corporation, Detroit.  
American Machine Products Co., Marshalltown, Ia.  
Arcweld Mfg. Co., Inc., Seattle, Wash.  
Atlas Heating & Ventilating Co., Ltd., San Francisco, Cal.  
Bishop & Babcock Mfg. Co., Cleveland, O.  
● Brauer Supply Co., A. G., St. Louis.  
● Brundage Co., Kalamazoo, Mich.  
Economy Baler Co., Ann Arbor, Mich.  
● Hess Warming & Ventilating Co., Chicago.  
MaGill Foundry & Furnace Works, P. H., Bloomington, Ill.  
● Mueller Furnace Co., L. J., Milwaukee, Wis.  
New York Blower Co., Chicago.  
Niagara Blower Company, New York City.  
Parker Heating & Manufacturing Co., St. Petersburg, Fla.  
Spray Wheel Air Conditioners, Inc., Denver, Colo.  
● Waterman-Waterbury Co., Minneapolis, Minn.

## BLOWER WHEELS

See Wheels, Blower

## BLOWERS, FORCED DRAFT, FOR ASH PIT

American Blower Corp., Detroit.  
Barrett Engineers, Cleveland Heights, O.  
Buffalo Forge Co., Buffalo, N. Y.  
Burnwell Corp., Allentown, Pa.  
Champion Blower & Forge Co., Lancaster, Pa.  
Economy Electric Mfg. Co., Cicero, Ill.  
Fuel Savers, Inc., Harrisburg, Pa.  
Garden City Fan Co., Chicago.  
General Blower Co., Philadelphia.  
● Henry Furnace & Fdy. Co., Cleveland.  
International Engineering, Inc., Dayton, O.  
Mohler Co., J. K., Ephrata, Pa.  
New York Blower Co., Chicago.  
Smith Manufacturing Co., Inc., F. A., Rochester, N. Y.  
South Bend Air Products, Inc., South Bend, Ind.  
● Sturtevant Co., B. F., Hyde Park, Boston.  
Universal Blower Co., Birmingham, Mich.  
Wing Mfg. Co., L. J., New York City.

## BLOWERS, FORCED DRAFT, FOR SMOKE PIPE

Barrett Engineers, Cleveland Heights, O.  
DeBothezat Ventilating Equip. Div., American Machine & Metals, Inc., East Moline, Ill.  
Garden City Fan Co., Chicago.  
Muncie Gear Works, Muncie, Ind.  
New York Blower Co., Chicago.

## BLOWERS, FURNACE CENTRIFUGAL

Agricola Furnace Co., Inc., Gadsden, Ala.  
Air Conditioning Equipment Co., Minneapolis, Minn.  
Air Controls, Inc., Cleveland, O.  
Aladdin Heating Corporation, Oakland, Cal.  
American Blower Corp., Detroit, Mich.  
American Foundry & Furnace Co., Bloomington, Ill.  
American Furnace Co., St. Louis, Mo.  
Ames Co., W. R., San Francisco, Cal.  
Atlas Heating & Ventilating Co., Ltd., San Francisco, Cal.  
Auburn Burner Company, Auburn, Ind.  
Autovent Fan & Blower Div., Herman Nelson Corporation, Chicago.  
Barrett Engineers, Cleveland Heights, O.  
Bishop & Babcock Mfg. Co., Cleveland, O.  
● Brundage Co., Kalamazoo, Mich.  
Buffalo Forge Co., Buffalo, N. Y.  
Campbell Heating Co., E. K., Kansas City, Mo.  
Campbell Heating Co., Des Moines, Ia.  
● Chandler Co., Cedar Rapids, Ia.  
Chicago Steel Furnace Co., Chicago, Ill.  
● Clarage Fan Co., Kalamazoo, Mich.  
Economy Baler Co., Ann Arbor, Mich.  
Economy Electric Mfg. Co., Cicero, Ill.  
Electrogas Furnace Co., San Francisco, Cal.  
Essick Manufacturing Co., Los Angeles.  
Freed Products Co., Moline, Ill.  
Furblo Co., Hermansville, Mich.  
Gehrl Co., Tacoma, Wash.



General Blower Co., Philadelphia, Pa.  
 General Blower Corp., San Francisco.  
 Grand Rapids Die & Tool Co., Grand Rapids, Mich.  
 Hall Manufacturing Co., Cedar Rapids, Iowa.  
 Hastings Air Conditioning Co., Inc., Hastings, Nebr.  
 ● Henry Furnace & Foundry Co., Cleveland.  
 ● Hess Warming & Ventilating Co., Chicago, Ill.  
 Jaden Mfg. Co., Inc., F., Hastings, Nebr.  
 ● Lau Blower Co., Dayton, O.  
 Lennox Furnace Co., Marshalltown, Iowa.  
 Majestic Co., Huntington, Ind.  
 ● Maple City Stamping Co., Peoria, Ill.  
 Mauer Engineering, Evanston, Ill.  
 ● Meyer Furnace Co., Peoria, Ill.  
 Montag Stove & Furnace Works, Portland, Ore.  
 Mountain States Equipment Company, Denver, Colo.  
 ● Mueller Furnace Co., L. J., Milwaukee, Wis.  
 National Manufacturing & Engineering Co., Detroit.  
 New-Aire Blower Co., Dearborn, Mich.  
 New York Blower Co., Chicago.  
 Northern Furnace & Supply Company, Billings, Mont.  
 ● Pacific Gas Radiator Co., Huntington Park, Cal.  
 Palmer Manufacturing Corp., Phoenix, Ariz.  
 Parker Heating & Manufacturing Co., St. Petersburg, Fla.  
 Peerless Electric Co., Warren, O.  
 ● Premier Furnace Co., Dowagiac, Mich.  
 Reynolds Mfg. Co., Grand Rapids, Mich.  
 ● Royal Air Conditioning Equip. Co., Alhambra, Cal.  
 Rudy Furnace Co., Dowagiac, Mich.  
 Ryniker Sheet Metal Works, Inc., Billings, Mont.  
 Security Manufacturing Co., Kansas City, Mo.  
 ● Schwitzer-Cummins Co., Indianapolis, Ind.  
 Skinner Htg. & Vent. Co., Heater Div. of St. Louis Blow  
 Pipe & Heater Co., Inc., St. Louis.  
 ● Skuttle Sales Company, Detroit.  
 Southern Fan & Blower Co., Dallas, Tex.  
 Spray Wheel Air Conditioners, Inc., Denver, Colo.  
 ● Sturtevant Co., B. F., Hyde Park, Boston.  
 Todd Air Conditioning Co., Inc., Bonner Springs, Kan.  
 ● U. S. Air Conditioning Corp., Minneapolis, Minn.  
 ● Utility Fan Corporation, Los Angeles, Cal.  
 Viking Air Conditioning Corp., Cleveland, O.  
 ● Waterman-Waterbury Co., Minneapolis, Minn.  
 Western Blower Co., Seattle, Wash.

## BLOWERS, VENTILATING SYSTEM

(Capacity 4,000 c.f.m. up)

Advance Fan & Blower Co., Detroit, Mich.  
 Air Controls, Inc., Cleveland, O.  
 Air-O-Line Co., Dallas, Tex.  
 Aladdin Heating Corporation, Oakland, Cal.  
 Allen Billmyre Corp., South Norwalk, Conn.  
 Allington & Curtis Mfg. Co., Saginaw, Mich.  
 American Blower Corp., Detroit, Mich.  
 American Coolair Corp., Jacksonville, Fla.  
 American Foundry & Furnace Co., Bloomington, Ill.  
 Ames Co., W. R., San Francisco, Cal.  
 Atlas Heating & Ventilating Co., Ltd., San Francisco, Cal.  
 Autovent Fan & Blower Div., Herman Nelson Corporation,  
 Chicago.  
 Ballantyne Co., Omaha, Nebr.  
 ● Bayley Blower Co., Milwaukee, Wis.  
 Bishop & Babcock Mfg. Co., Cleveland, O.  
 ● Brundage Co., Kalamazoo, Mich.  
 Buffalo Forge Co., Buffalo, N. Y.  
 Campbell Heating Co., E. K., Kansas City, Mo.  
 Champion Blower & Forge Co., Lancaster, Pa.  
 ● Clarage Fan Co., Kalamazoo, Mich.  
 Columbus Heating & Vent. Co., Columbus, O.  
 Coppus Engineering Corp., Worcester, Mass.  
 De Bothezat Ventilating Equipment Division, American Ma-  
 chine & Metals, Inc., East Moline, Ill.  
 Economy Electric Manufacturing Co., Cicero, Ill.  
 Electrovent Fan & Mfg. Co., Chicago.  
 Furblo Co., Hermansville, Mich.  
 Garden City Fan Co., Chicago, Ill.  
 General Blower Co., Philadelphia, Pa.  
 Grand Rapids Die & Tool Co., Grand Rapids, Mich.  
 Hastings Air Conditioning Company, Inc., Hastings, Nebr.  
 ● Ilg Electric Ventilating Co., Chicago, Ill.  
 Jaden Mfg. Co., Inc., F., Hastings, Nebr.  
 Johnson Fan & Blower Corp., Chicago, Ill.  
 King Ventilating Co., Owatonna, Minn.  
 ● Lau Blower Co., Dayton, O.  
 Lehigh Fan & Blower Co., Allentown, Pa.  
 MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.  
 Montag Stove & Furnace Works, Portland, Ore.  
 Mountain States Equipment Co., Denver, Colo.  
 National Manufacturing & Engineering Co., Detroit.  
 New York Blower Co., Chicago, Ill.  
 Niagara Blower Co., New York City.  
 Northern Blower Co., Cleveland, Ohio.  
 Palmer Manufacturing Corp., Phoenix, Ariz.  
 Parker Heating & Manufacturing Co., St. Petersburg, Fla.  
 Peerless Electric Co., Warren, O.  
 Phelps Mfg. Co., Little Rock, Ark.  
 Reynolds Manufacturing Co., Grand Rapids, Mich.  
 ● Royal Air Conditioning Equip. Co., Alhambra, Cal.  
 ● Schwitzer-Cummins Co., Indianapolis, Ind.

Skinner Heating & Vent. Co., Heater Div. of St. Louis Blow  
 Pipe & Heater Co., St. Louis.  
 Smith Heater Co., Peter, Detroit, Mich.  
 Southern Fan & Blower Co., Dallas, Tex.  
 Spray Wheel Air Conditioners, Inc., Denver, Colo.  
 ● Sturtevant Co., B. F., Hyde Park, Boston, Mass.  
 Supreme Heater & Ventilating Corp., St. Louis, Mo.  
 Todd Air Conditioning Co., Inc., Bonner Springs, Kans.  
 Trane Company, LaCrosse, Wis.  
 ● U. S. Air Conditioning Corp., Minneapolis, Minn.  
 ● Utility Fan Corporation, Los Angeles, Cal.  
 Viking Air Conditioning Corp., Cleveland.  
 Western Blower Co., Seattle, Wash.  
 Wing Mfg. Co., L. J., New York City.

## BLOW PIPE EQUIPMENT

See Blast Gates; Collectors, Blow Pipe; Fittings. Blow Pipe

## BOARD, DUCT, ASBESTOS

● Sall Mountain Co., Chicago.  
 ● Wilson, Inc., Grant, Chicago.

## BOLTS, EXPANSION

Chicago Expansion Bolt Co., Chicago.  
 Diamond Expansion Bolt Co., Inc., Garwood, N. J.  
 Fee & Mason Mfg. Co., Inc., New York City.  
 National Lead Co., New York City.  
 Ohio Brass Co., Mansfield, Ohio.  
 Paine Company, The, Chicago.  
 Rawlplug Company, Inc., New York City.  
 Rolyan Corp., Chicago.  
 Star Expansion Bolt Co., New York City.  
 U. S. Expansion Bolt Co., Inc., York, Pa.

## BOLTS, TOGGLE AND ANCHOR

Carty & Moore Engineering Co., Detroit.  
 Chase Brass & Copper Co., Incorporated, Waterbury, Conn.  
 Chicago Expansion Bolt Co., Chicago.  
 Diamond Expansion Bolt Co., Inc., Garwood, N. J.  
 Fee & Mason Mfg. Co., Inc., New York City.  
 Grabler Mfg. Co., Cleveland.  
 Lamson & Sessions Co., Cleveland.  
 Paine Company, The, Chicago.  
 Rawlplug Company, Inc., New York City.  
 ● Republic Steel Corp., Cleveland.  
 Rolyan Corp., Chicago.  
 Star Expansion Bolt Co., New York City.  
 U. S. Expansion Bolt Co., Inc., York, Pa.

## BOOSTER FANS

See Fans, Booster

## BOOTS, FURNACE PIPE

See Fittings and Accessories, Furnace Pipe

## BRAKES, METAL WORKERS', HAND

Bertsch & Co., Cambridge City, Ind.  
 ● Dreis & Krump Mfg. Co., Chicago, Ill.  
 Eiker Mfg. Co., Ogallala, Nebr.  
 New Albany Machine Mfg. Co., New Albany, Ind.  
 ● Niagara Machine & Tool Works, Buffalo, N. Y.  
 O'Neill-Irwin Mfg. Co., Minneapolis.  
 Peck, Stow & Wilcox Co., Southington, Conn.  
 Weiss & Co., H., New York City.  
 ● Whitney Metal Tool Co., Rockford, Ill.

## BRAKES, METAL WORKERS', PORTABLE

● Dreis & Krump Mfg. Co., Chicago.  
 Eiker Mfg. Co., Ogallala, Nebr.  
 Harris, A. R., Hammond, Ind.  
 O'Neill-Irwin Mfg. Co., Minneapolis.  
 ● Whitney Metal Tool Co., Rockford, Ill.

## BRAKES, METAL WORKERS', POWER

Bertsch & Co., Cambridge City, Ind.  
 Cincinnati Shaper Co., Cincinnati, O.  
 ● Dreis & Krump Mfg. Co., Chicago, Ill.  
 Excelsior Tool and Machine Co., East St. Louis, Ill.  
 Heartley Machine & Tool Co., Toledo, O.  
 Ohl & Co., Geo. A., Newark, N. J.  
 Peck, Stow & Wilcox Co., Southington, Conn.  
 Rafter Machine Co., Belleville, N. J.  
 Swaine Mfg. Co., Fred J., St. Louis.  
 ● Verson Allsteel Press Co., Chicago.  
 Weiss & Co., H., New York City.

## BRUSHES, ACID

Cleveland Brush Factory, Inc., Cleveland, O.  
 Lukens Metal Co., Thos. F., Philadelphia, Pa.  
 ● Meyer & Bro. Co., F., Peoria, Ill.  
 Milwaukee Brush Mfg. Co., Milwaukee, Wis.  
 Osborn Mfg. Co., Cleveland, O.  
 Potomac Mfg. Co., Philadelphia, Pa.  
 Schaefer Brush Mfg. Co., Milwaukee, Wis. (Rustproof)  
 Weiss & Co., H., New York City.

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## BRUSHES, FURNACE

- Adams Company, The, Dubuque, Iowa.
- Baker Furnace & Cleaner Mfg. Co., Toledo, O. (for cleaning Chimneys)
- Farrell-Cheek Steel Company, Stoker Parts Div., Sandusky, Ohio.
- Mill-Rose Co., Cleveland, O.
- Milwaukee Brush Mfg. Co., Milwaukee, Wis.
- Osborn Mfg. Co., Cleveland, O.
- Pilley Brush Co., Fort Madison, Iowa.
- Schaefer Brush Mfg. Co., Milwaukee, Wis.
- Swift, Carl E., Holland, Mich.
- Worcester Brush & Scraper Co., Worcester, Mass.

## BUFFERS, GRINDERS, POLISHERS AND SANDERS, ELECTRIC

- Baldor Electric Co., St. Louis.
- Black & Decker Mfg. Co., Towson, Md.
- Buckeye Portable Tool Co., Dayton, O.
- Champion Blower & Forge Co., Lancaster, Pa.
- Chicago Pneumatic Tool Co., New York City.
- Cincinnati Electrical Tool Co., Cincinnati, O. (with dust collector).
- Clark Jr. Electric Co., Jas., Louisville, Ky.
- Continental Machines Incorporated, Minneapolis.
- Detroit Surfacing Machine Co., Detroit.
- Diehl Mfg. Co., Elizabethport, N. J.
- Hammond Machinery Builders, Kalamazoo, Mich.
- Haskins Co., R. G., Chicago.
- Hobart Brothers Company, Troy, O.
- Independent Pneumatic Tool Co., Chicago, Ill.
- Jefferson Machine Tool Co., Cincinnati, Ohio.
- Keller, Inc., Wm. H., Grand Haven, Mich.
- Lee Co., K. O., Aberdeen, S. D.
- Mall Tool Co., Chicago, Ill.
- Millers Falls Co., Greenfield, Mass.
- Misener Mfg. Co., Inc., Syracuse, N. Y.
- Reynolds Electric Company, Chicago.
- Skilsaw, Inc., Chicago, Ill.
- Snap-On Tools Corp., Kenosha, Wis.
- Speedway Mfg. Co., Cicero, Ill.
- Stanley Electric Tool Div., The Stanley Works, New Britain, Conn.
- Stow Mfg. Co., Binghamton, N. Y.
- Syntron Co., Homer City, Pa.
- United States Electrical Tool Co., Cincinnati, O.
- U. S. Electrical Motors, Inc., Los Angeles.
- Van Dorn Electric Tool Co., Towson, Md.
- Wodack Electric Tool Corp., Chicago, Ill.

## BURNERS, GAS, CONVERSION, RESIDENTIAL

- Auburn Burner Co., Auburn, Ind.
- Autogas Company, Chicago.
- Barber Gas Burner Co., Cleveland, O.
- Bard Manufacturing Company, Bryan, Ohio.
- Beck Engineering Combustion Company, St. Louis, Mo.
- Bryan Steam Corp., Peru, Ind.
- Bryant Corp., C. L., Cleveland, O.
- Bryant Heater Co., Cleveland, O.
- Burdett Mfg. Co., Chicago, Ill.
- Columbia Burner Co., Toledo, O.
- Continental Stove Corp., Ironton, O.
- Dalzen Manufacturing Co., Detroit.
- Franklin Gas Heating Co., Cincinnati, Ohio.
- Grand Rapids Blow Pipe and Dust Arrester Co., Grand Rapids, Mich.
- Handley-Brown Heater Co., Jackson, Mich.
- Hudson, H. A., Buffalo.
- Jackson Sheet Metal Works, Ogden, Utah.
- Johnson Gas Appliance Co., Cedar Rapids, Iowa.
- Kais Sunrise Works, Detroit.
- Leahy Mfg. Co., Los Angeles, Cal.
- Martin, J. O. & C. U., San Francisco.
- Moncrief Furnace & Mfg. Co., Inc., Dallas, Tex.
- National Machine Works, Chicago, Ill.
- Roberts-Gordon Appliance Corp., Buffalo, N. Y.
- Rotary Mfg. Co., Los Angeles, Cal.
- Security Manufacturing Co., Kansas City, Mo.
- Sonner Burner Co., Winfield, Kans.
- Standard Heating & Radiator Co., Pittsburgh, Pa.
- Surface Combustion Corp., Toledo, O.
- Webster Engineering Co., Tulsa, Okla.
- Zinc Co., John, Tulsa, Okla.

## BURNERS, OIL, CONVERSION, RESIDENTIAL

- Ace Engineering Co., Chicago, Ill. (Rotary)
- Acme Oil Burner Company, Inc., Cedar Rapids, Ia. (Gun)
- Airtemp Division, Chrysler Corp., Dayton, Ohio.
- Aldrich Co., Wyoming, Ill.
- American Radiator & Standard Sanitary Corp., Pittsburgh, (Gun)
- Arweld Mfg. Co., Inc., Seattle, Wash.
- Auburn Burner Co., Auburn, Ind. (Gun and rotary)
- Auto-Heat Corp., New York City. (Gun)
- Automatic Burner Corp., Chicago, Ill. (Gun and rotary)
- Badger Mfg. Co., Madison, Wis. (Gun)
- Bard Manufacturing Company, Bryan, Ohio.
- Beckett Engineering Co., R. W., Elyria, Ohio. (Gun)

- Bennett Gil Company, Omaha, Neb. (Gun)
- Berryman Oil Burner Co., Chicago, Ill. (Gun, Gravity and Rotary)
- Bethlehem Foundry & Machine Co., Bethlehem, Pa. (Gun)
- Bovee Furnace Works, Waterloo, Ia. (Gun)
- Brigham Oil Burner Co., St. Louis, Mo. (Gravity)
- Bryan Steam Corp., Peru, Ind. (Rotary and gun)
- Calorol Burner Corp., Hartford, Conn. (Atmospheric, gun, horizontal rotary, vacuum pressure, wall flame)
- Campbell Machine Co., Minneapolis.
- Cary Mfg. Co., Waupaca, Wis. (Gravity)
- Carrier Corp., Syracuse, N. Y.
- Century Engineering Corp., Cedar Rapids, Ia. (Gun)
- Chalmers Oil Burner Co., Minneapolis, Minn. (Gun and rotary)
- Chandler Company, Cedar Rapids, Iowa (Gun and gravity)
- Chicago Steel Furnace Co., Chicago, Ill.
- Cleveland Steel Products Corp., Toridheet Div., Cleveland, O. (Gun and rotary)
- Columbus Metal Products, Inc., Columbus, Ohio. (Gravity)
- Delco Appliance Div., General Motors Sales Corp., Rochester, N. Y. (Gun)
- D'Elia Oil Burner Co., Inc., Bridgeport, Conn. (Gun)
- Dowagiac Steel Furnace Company, Dowagiac, Mich.
- Eastern Oil & Equipment Co., Portland, Me. (Gun)
- Electrol Incorporated, Clifton, N. J. (Gun)
- Excello Oil Heating Corp., Omaha, Nebr.
- Fairfield Oil Heating Co., Inc., Greenwich, Conn. (Gun)
- Fargo Foundry Co., Fargo, N. D. (Gun)
- Florence Stove Co., Gardner, Mass. (Gravity)
- Fluid Heat Division, Anchor Post Fence Co., Baltimore. (Gun and Rotary)
- General Electric Co., Bloomfield, N. J. (Gun)
- General Oil Heating Corp., West New York, N. J. (Gun)
- Gilbert & Barker Mfg. Co., Springfield, Mass. (Gun)
- Gilmore, Jackson E., Columbus, Ohio. (Gravity)
- Gold Star Oil Burner Mfg. Co., Inc., Yonkers, N. Y. (Gun)
- Gould Engineering Co., Cambridge, Mass. (Gun)
- Green Colonial Furnace Company, Des Moines, Iowa. (Gun)
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Hardinge Oil Burner Co., Chicago, Ill.
- Hart Oil Burner Corp., Peoria, Ill. (Gun)
- Harvey-Whipple, Inc., Springfield, Mass. (Gun)
- Heatseal Burner Co., Omaha, Nebr. (Gun)
- Hell Co., Milwaukee, Wis. (Gun)
- Herco Oil Burner Corp., Lancaster, Pa.
- Hess Warming and Ventilating Co., Chicago, Ill.
- Hipoint Corp., Bellefontaine, O.
- Holtum Mfg. Co., Freeport, Ill. (Gun)
- Homer Furnace & Foundry Corp., Coldwater, Mich. (Gun)
- Hotentot Co., Inc., Omaha, Nebr. (Gun)
- Hubbard Co., Minneapolis, Minn. (Gun)
- Hueller Mfg. Co., Inc., H. J., Brooklyn, N. Y. (Gun)
- Iowa Foundry Co., Sioux City, Ia.
- Johnson Co., S. T., Oakland, Cal., and Philadelphia. (Gun)
- Johnson Mfg. Co., Waterloo, Ia. (Gun)
- Kais Sunrise Works, Detroit, Mich. (Gravity and rotary)
- Kaybar Burner Corp., Chicago, Ill.
- Keith Furnace Co., Des Moines, Ia. (Gun)
- Kleen Heat, Inc., Chicago, Ill. (Gun and Gravity)
- Korth Oil Burner Corp., Roselle Park, N. J. (Rotary and gun)
- Laco Oil Burner Co., Griswold, Ia. (Gun and Gravity)
- Landwehr Heating Corp., Philadelphia, Pa.
- Leahy Mfg. Co., Los Angeles, Cal.
- Leeson Air Conditioning Corporation, Detroit, Mich. (Gun)
- Lennox Furnace Co., Marshalltown, Iowa. (Gun—Pressure Atomizing)
- Little Burner Co., Inc., H. C., San Rafael, Cal. (Gravity)
- Littleford Bros., Cincinnati, O.
- Lochinvar Products, Dearborn, Mich.
- Mahan Oil Burner & Furnace Co., Elmhurst, Ill. (Gravity)
- Majestic Co., Huntington, Ind. (Gun)
- Malleable Iron Fittings Co., Banford, Conn. (Gun)
- May Oil Burner Corp., Baltimore, Md. (Gun)
- Mayflower Oil Burner Corp., West New York, N. J. (Gun)
- Meyer Furnace Co., Peoria, Ill. (Gun)
- Micro-Westco, Inc., Bettendorf, Iowa.
- Miller Co., Meriden, Conn.
- ModernAire Co., Div. Des Moines Stove Repair Co., Des Moines, Ia.
- Montag Stove & Furnace Works, Portland, Ore. (Gun)
- National Alroil Burner Co., Philadelphia, Pa. (Gun)
- National Iron Works, San Diego, Cal.
- Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit, Mich.
- Nu-Way Corp., Rock Island, Ill. (Gun)
- Pan-American Engineering Company, Berkeley, Cal. (Gun, rotary and turbine)
- Paragon Oil Burner Corp., Brooklyn, N. Y.
- Peerless Oil Burner Co., Inc., Kansas City, Mo. (Gravity)
- Penn Boller & Burner Mfg. Corp., Lancaster, Pa. (Gun)
- Peoples Oil Burner Co., Chicago, Ill. (Gravity)
- Petroleum Heat & Power Co., Stamford, Conn. (Rotary and gun)
- Pioneer Manufacturing Co., Cedar Rapids, Ia.
- Preferred Utilities Manufacturing Corp., New York City.

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Pressure Oil Burners, Inc., York, Pa. (Gun)  
 Quaker Mfg. Co., Chicago. (Gravity)  
 Quick Furnace & Supply Co., Des Moines, Ia.  
 Quiet-Heat Mfg. Corp., Newark, N. J. (Gun)  
 • Quincy Stove Mfg. Co., Quincy, Ill. (Gravity)  
 R-S Products Corp., Philadelphia, Pa. (Gun)  
 Ray Oil Burner Co., San Francisco, Cal. (Gun, gravity and rotary)  
 Relf-Rexoil, Inc., Buffalo, N. Y.  
 Rotary Mfg. Co., Los Angeles, Cal. (Rotary)  
 • Round Oak Co., Dowagiac, Mich. (Gun)  
 Rudy Furnace Co., Dowagiac, Mich.  
 • Rybolt Heater Company, Ashland, Ohio. (Gun)  
 Sanmyer Corporation, Chicago. (Gun)  
 Sandberg Co., H. J., Portland, Ore.  
 Scott-Newcomb, Inc., St. Louis, Mo. (Gun)  
 Sentry Mfg. Co., Omaha, Nebr. (Gun)  
 Shedlov Oil Burners, Inc., Minneapolis, Minn. (Gravity, gun)  
 Silent Glow Oil Burner Corp., Hartford, Conn. (Gun and rotary)  
 Silent Sioux Oil Burner Corp., Orange City, Ia. (Gravity)  
 Simplex Oil Heating Corp., New York City. (Gun, rotary and turbine)  
 Skinner Co., E. W., Fitchburg, Mass. (Gravity)  
 Sundstrand Engineering Co., Rockford, Ill. (Gun)  
 Sun-Ray Oil Burner Corp., Rockaway Park, N. Y. (Gun)  
 Syncro-Flame Burner Corp., Willimantic, Conn. (Gun, rotary)  
 Timken Silent Automatic Div., Timken-Detroit Axle Co., Detroit. (Gun and rotary)  
 Todd Combustion Equipment, Inc., New York City.  
 United States Burner Corp., Wethersfield, Conn. (Gun and rotary)  
 Universal Manufacturers, Inc., Midland Park, N. J.  
 Valley Mfg. Co., Athol, Mass. (Gun and rotary)  
 Victor Oil Burner Mfg. Co., Hartford, Conn. (Gravity)  
 Volcano Burner Corp., New York City. (Gun)  
 Vortex Mfg. Co., Portland, Ore.  
 • Waterman-Waterbury Co., Minneapolis. (Gun)  
 Wayne Oil Burner Corp., Fort Wayne, Ind. (Gun and gravity)  
 Weatherall Engineers, Inc., Providence, R. I. (Gun)  
 Westinghouse Electric & Mfg. Co., Springfield, Mass. (Gun and gravity)  
 Westwick & Son, Inc., John, Galena, Ill. (Gun)  
 Williams Oil-O-Matic Heating Corp., Bloomington, Ill. (Gun)  
 Wood Industries, Inc., Gar, Detroit, Mich. (Gun)  
 Woolery Machine Co., Minneapolis, Minn. (Gun)  
 York Ice Machinery Corp., York, Pa. (Gun)  
 York Oil Burner Co., Inc., York, Pa. (Gun)

## BURRING MACHINES

*See Machines, Burring*

## CABINETS AND CASINGS

Acme Tin Plate & Roofing Supply Co., Philadelphia.  
 Airwasher Corporation, Lansing, Mich.  
 Armstrong Furnace Company, Columbus, Ohio.  
 Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.  
 Biersach & Niedermeyer Company, Milwaukee.  
 • Brundage Co., Kalamazoo, Mich.  
 Char-Gale Mfg. Co., Minneapolis, Minn.  
 Chicago Metal Mfg. Co., Chicago.  
 Dahlstrom Metallic Door Co., Jamestown, N. Y.  
 Dry-Zero Corporation, Chicago.  
 Falstrom Co., Passaic, N. J.  
 General Blower Corp., San Francisco.  
 General Metal Products Co., St. Louis, Mo.  
 Hauserman Co., E. F., Cleveland.  
 • Lau Blower Co., Dayton, Ohio.  
 Lennox Furnace Co., Marshalltown, Ia.  
 Maysteel Products, Inc., Mayville, Wis.  
 Michell Air Conditioning Co., Inc., Schenectady, N. Y.  
 Mullins Mfg. Corp., Warren, Ohio.  
 National Manufacturing & Engineering Co., Detroit.  
 Riester & Thesmacher Co., Cleveland.  
 St. Charles Mfg. Co., St. Charles, Ill.  
 Skinner Heating & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.  
 Standard Pressed Steel Co., Jenkintown, Pa.  
 Steinhurst & Sons, Inc., Emil, Utica, N. Y.

## CAPS AND TOPS, CHIMNEY

• Accurate Mfg. Works, Chicago, Ill.  
 Acme Tin Plate & Roofing Supply Co., Philadelphia, Pa.  
 • Adams Company, The, Dubuque, Iowa.  
 • Allen Corp., Detroit, Mich.  
 Ames Co., W. R., San Francisco, Cal.  
 Chicago Metal Mfg. Co., Chicago, Ill.  
 Edwards Mfg. Co., Inc., Cincinnati, O.  
 Excelsior Steel Furnace Co., Chicago, Ill.  
 Hirschman Co., Inc., W. F., Buffalo, N. Y.  
 Industrial Sheet Metal Works, Inc., Detroit, Mich.  
 Iwan Brothers, South Bend, Ind.  
 Lamb & Ritchie Co., Cambridge, Mass.  
 • Little Burner Co., Inc., H. C., San Rafael, Cal.  
 Martin Metal Mfg. Co., Wichita, Kan.  
 • Meyer & Bro. Co., F., Peoria, Ill.  
 • Milcor Steel Co., Milwaukee, Wis.  
 Neemes Foundry, Inc., Troy, N. Y.

Northern Furnace & Supply Company, Billings, Mont.  
 • Osborn Co., J. M. & L. A., Cleveland.  
 Royal-Apex Mfg. Corp., Brooklyn.  
 Ryniker Sheet Metal Works, Inc., Billings, Mont.  
 Schoedinger Co., F. O., Columbus, O.  
 Sheet Metal Mfg. Co., Inc., Brooklyn.  
 Southbridge Roofing Co., Inc., Southbridge, Mass.  
 Sterling Foundry Company, Sterling, Ill. (Cast iron)  
 Tierney Rotor Ventilator Co., Minneapolis, Minn.  
 Vail Mfg. Co., Fort Wayne, Ind.

## CASINGS

*See Cabinets and Casings*

## CAULKING COMPOUNDS

*See Compounds, Caulking*

## CEILINGS, METAL

Berger Mfg. Div., Republic Steel Corp., Canton, O.  
 Brooklyn Metal Ceiling Co., Brooklyn, N. Y.  
 Canton Steel Ceiling Mfg. Co., Canton, O.  
 • Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.  
 Edwards Mfg. Co., Inc., Cincinnati, O.  
 Friedley-Voshardt Co., Chicago, Ill.  
 International Steel Company, Evansville, Ind.  
 Klauer Mfg. Co., Dubuque, Ia.  
 Lucius, Wm. I., New York City.  
 Martin-Parry Corp., York, Pa.  
 Mesker & Co., Geo. L., Evansville, Ind.  
 • Milcor Steel Co., Milwaukee, Wis.  
 Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.  
 Reeves Steel & Mfg. Co., Dover, O.  
 Schoedinger Co., F. O., Columbus, O.  
 Sheet Metal Mfg. Co., Inc., Brooklyn.  
 Southern States Iron Roofing Co., Savannah, Ga.  
 Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.  
 Wheeling Corrugating Co., Wheeling, W. Va.  
 Woolwine Metal Products Co., Los Angeles, Cal.

## CEMENT, FURNACE

Acme Asbestos Covering & Flooring Co., Chicago.  
 • Armstrong Co., Detroit, Mich.  
 Buckeye Products Co., Cincinnati, O.  
 Carey Co., Philip, Cincinnati, O.  
 Chicago Fire Brick Company, Chicago.  
 Clinton Metallic Paint Co., Clinton, N. Y. (Asbestos)  
 Colebrook & Sons, Inc., W. H., Syracuse, N. Y.  
 Continental Products Co., Euclid, O.  
 Ehret Magnesite Mfg. Co., Valley Forge, Pa.  
 Fireline Stove & Furnace Lining Co., Chicago, Ill.  
 • Grant Wilson, Inc., Chicago. (Asbestos)  
 Green Fire Brick Co., A. P., Mexico, Mo.  
 Hercules Chemical Co., Inc., New York City.  
 Hetzel Roofing Products Co., Newark, N. J.  
 Johns-Manville, New York City.  
 Keasbey Co., Robert A., New York City. (Asbestos)  
 Krehbiel Co., J. H., Chicago, Ill.  
 Laclede-Christy Clay Products Co., St. Louis, Mo.  
 Lastik Products Co., Inc., Pittsburgh, Pa.  
 • McLeod & Henry Co., Inc., Troy, N. Y.  
 Munn and Steele, Inc., Newark, N. J.  
 Nebel Manufacturing Co., Cleveland.  
 Pecora Paint Co., Philadelphia, Pa.  
 Plastic Products Co., Detroit, Mich.  
 Preferred Utilities Mfg. Corp., New York City.  
 Presstite Engineering Co., St. Louis, Mo.  
 Pyrolite Products Co., Cleveland, O.  
 Refractory & Insulation Corp., New York City.  
 Robinson Insulation Co., Great Falls, Mont.  
 Ruberoid Co., New York City.  
 Rutland Fire Clay Co., Rutland, Vt.  
 • Sall Mountain Co., Chicago, Ill.  
 Sauerelsen Cements Co., Sharpsburg, Pa.  
 Standard Asbestos Mfg. Co., Chicago, Ill.  
 Standard Fuel Engineering Co., Detroit, Mich.  
 U. S. Stoneware Company, Akron, Ohio.  
 • Walsh Refractories Corp., St. Louis, Mo.  
 Wilhelm Co., A., Reading, Pa.  
 • Wilson, Inc., Grant, Chicago, Ill. (Asbestos)

## CEMENT, INSULATING

Acme Asbestos Covering & Flooring Co., Chicago.  
 Baldwin-Hill Co., Trenton, N. J. (Rockwool)  
 Barrett Division, Allied Chemical & Die Corporation, New York City.  
 Bird Archer Co., Philadelphia.  
 Botsfield Refractories Co., Philadelphia.  
 Carey Co., Philip, Cincinnati, Ohio. (Asbestos, Mag., Rockwool)  
 Carney Rockwool Co., Mankato, Minn. (Rockwool)  
 Chicago Fire Brick Co., Chicago, Ill. (Asbestos)  
 Clinton Metallic Paint Co., Clinton, N. Y.  
 Colebrook & Sons, Inc., W. H., Syracuse, N. Y.  
 Eagle-Picher Lead Co., Cincinnati, O.  
 Ehret Magnesite Mfg. Co., Valley Forge, Pa. (Asbestos)  
 • Grant Wilson, Inc., Chicago. (Asbestos)  
 Green Fire Brick Company, A. P., Mexico, Mo. (Vermiculite)  
 Industrial Research, Lansdowne, Pa.

• Advertisement in this issue. See Index to Advertisers, page 310



International Vermiculite Co., Springfield, Ill. (Vermiculite)  
 Johns-Manville, New York City (Asbestos)  
 Keasbey Co., Robert A., New York City. (Asbestos)  
 Keasbey & Mattison Co., Ambler, Pa. (Asbestos)  
 Krehbiel Co., J. H., Chicago (Asbestos, mineral wool)  
 ● McLeod & Henry Co., Inc., Troy, N. Y.  
 Munn and Steele, Inc., Newark, N. J. (Vermiculite)  
 National Engineering Products, Inc., Washington, D. C.  
 National Gypsum Co., Buffalo.  
 Norristown Magnesite & Asbestos Co., Norristown, Pa.  
 Ohmlac Paint & Refining Co., Chicago.  
 Owens-Corning Fiberglass Corp., Toledo, Ohio.  
 Poe Co., C. W., Cleveland. (Mineral Wool)  
 Preferred Utilities Mfg. Corp., New York City.  
 Pyrolite Products Co., Cleveland, O.  
 Quigley Company, Inc., New York City (H T Asbestos)  
 Ramtite Co., Div. of S. Obermayer Co., Chicago.  
 Refractory & Insulation Corp., New York City. (Wool)  
 ● Rex Clay Products Co., Detroit.  
 Robinson Insulation Co., Great Falls, Mont. (Vermiculite)  
 Rock Fleece Co., El Paso, Texas.  
 Ruberoid Co., New York City. (Asbestos)  
 Rutland Fire Clay Co., Rutland, Vt. (Asbestos)  
 ● Sall Mountain Co., Chicago, Ill.  
 Sauereisen Cements Co., Pittsburgh.  
 Schundler & Co., Inc., F. E., Joliet, Ill.  
 Smith & Kanzler Corp., Elizabeth, N. J. (Asbestos)  
 Smooth-On Mfg. Co., Jersey City, N. J.  
 Standard Asbestos Mfg. Co., Chicago, Ill.  
 Standard Fuel Engineering Co., Detroit. (Rock wool and asbestos)  
 Standard Lime & Stone Co., Baltimore.  
 Tennessee Products Corp., Nashville, Tenn. (Mineral Wool)  
 Therminsol Corp., Kalamazoo, Mich.  
 Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.  
 United States Gypsum Co., Chicago. (Asbestos)  
 United States Mineral Wool Co., Chicago. (High temperature mineral wool)  
 Universal Zonolite Insulation Co., Chicago (Vermiculite)  
 Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.  
 ● Wilson, Inc., Grant, Chicago, Ill. (Asbestos)

### CEMENT, ROOF

Acme Asbestos Covering & Flooring Co., Chicago.  
 Acme Refining Co., Cleveland, O. (Liquid and plastic)  
 Acorn Refining Co., Cleveland.  
 All States Roofers Equipment & Material Co., Chicago, Ill.  
 American-Marietta Company, Chicago.  
 ● Armstrong Co., Detroit.  
 Barber Asphalt Corp., Barber, N. J.  
 Barrett Division, Allied Chemical & Die Corporation, New York City.  
 Calbar Paint & Varnish Co., Philadelphia, Pa.  
 Carey Co., Philip, Cincinnati, O.  
 Carter Paint Co., Liberty, Ind.  
 Celotex Corp., Chicago.  
 Certain-teed Products Corp., New York City.  
 Clinton Metallic Paint Co., Clinton, N. Y.  
 Connors Paint Mfg. Co., Wm., Troy, N. Y.  
 Continental Products Co., Euclid, O.  
 Ehret Magnesia Mfg. Co., Valley Forge, Pa.  
 Flintkote Co., New York City.  
 Ford Roofing Products Co., Chicago.  
 Glidden Co., Cleveland, O.  
 Hetzel Roofing Products Co., Newark, N. J.  
 Horn Co., A. C., Long Island City, N. Y.  
 Iowa Paint Mfg. Co., Des Moines, Ia. (Asphalt)  
 Johns-Manville, New York City.  
 Koppers Company, Pittsburgh.  
 Krehbiel Co., J. H., Chicago. (Asphaltic, Gilsonite, Elaterite)  
 Lastik Products Co., Inc., Pittsburgh, Pa.  
 Lehon Company, Chicago.  
 Miller & Son, C. Arthur, Elmira, N. Y.  
 National Mfg. Corp., Tonawanda, N. Y.  
 Nebel Manufacturing Co., Cleveland.  
 North American Fibre Products Co., Cleveland.  
 Ohmlac Paint & Refining Co., Chicago, Ill.  
 Pecora Paint Co., Philadelphia, Pa. (Asbestos)  
 Presstite Engineering Co., St. Louis, Mo.  
 Pyrolite Products Co., Cleveland, O.  
 Rock Fleece Company, El Paso, Texas.  
 Ruberoid Co., New York City.  
 Rutland Fire Clay Co., Rutland, Vt.  
 Southport Paint Co., Savannah, Ga.  
 Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.  
 Tropical Paint & Oil Co., Cleveland, O.  
 United States Gypsum Co., Chicago, Ill.  
 Wilhelm Co., A., Reading, Pa.

### CHAIN, FURNACE

American Chain Div., American Chain & Cable Co., Inc., York, Pa.  
 ● Bead Chain Mfg. Co., Bridgeport, Conn.  
 Bridgeport Chain & Mfg. Co., Bridgeport, Conn.  
 Corbin Screw Corp., New Britain, Conn.  
 ● Hart & Cooley Mfg. Co., Holland, Michigan.  
 Hodell Chain Co., Cleveland.  
 McKay Co., York, Pa.

Russell Mfg. Co., John M., Naugatuck, Conn.  
 Turner & Seymour Mfg. Co., Torrington, Conn.

### CHAMBERS, COMBUSTION, PREFORMED

Barclay, Inc., Robert, Chicago.  
 Chicago Fire Brick Company, Chicago.  
 Gilbert & Son, Harry E., Bridgeport, Conn.  
 Green Fire Brick Company, A. P., Mexico, Mo.  
 Lite-Cast Corp., Philadelphia.  
 ● McLeod & Henry Co., Inc., Troy, N. Y.  
 Monogram Combustion Chamber Co., Philadelphia.  
 Refractory & Insulation Corporation, New York City.  
 ● Rex Clay Products Company, Detroit.  
 Universal Zonolite Insulation Co., Chicago.

### CHANNELS

See Angles, Bars, Beams, Channels and Tees (Light Weight Shapes)

### CHEMICALS, RUST PREVENTIVE FOR PRETREATING METALS

American Chemical Paint Co., Ambler, Pa.  
 Neilco Chemical Co., Detroit.  
 Neilson Chemical Co., Detroit.  
 North American Fibre Products Co., Cleveland.  
 Parker Rust-Proof Co., Detroit.  
 Rust Products Co. of America, Chicago.  
 Rusticide Products Co., Cleveland.  
 Standard Steel Spring Co., Gary, Ind.

### CHIMNEY CAPS

See Caps and Tops, Chimney

### CLEANERS, POLISHERS AND FINISHERS, METAL (Liquid, Paste and Powder)

Nu Steel Company, Chicago.  
 Tamms Silica Company, Chicago.

### CLEANERS, VACUUM, FURNACE

Baker Furnace & Cleaner Mfg. Co., Toledo, O.  
 Breuer Electric Mfg. Co., Chicago, Ill.  
 Densmore-Quinlan Co., Kenosha, Wis.  
 Dickson Coal Co., New York City.  
 ● Doyle Vacuum Cleaner Co., Grand Rapids, Mich.  
 ● Electric Vacuum Cleaner Co., Inc., Cleveland, O.  
 Ideal Commutator Dresser Co., Sycamore, Ill.  
 Kent Co., Inc., Rome, N. Y.  
 Minn-Kota Foundry & Mfg. Co., Fargo, N. D.  
 ● National Super Service Co., Toledo, O.  
 Spencer Turbine Co., Hartford, Conn.  
 ● Sturtevant Co., B. F., Hyde Park, Boston, Mass.  
 Swift, Carl E., Holland, Mich.

### CLEAT BENDERS

See Machines, Cleat Bending

### CLIPS, FASTENING, FOR ROOFING

American Sheet Metal Works, New Orleans, La.  
 ● Bard Manufacturing Co., Bryan, O.  
 ● Berger Brothers Co., Philadelphia, Pa.  
 Bridesburg Foundry Co., Philadelphia, Pa.  
 Edwards Mfg. Co., Inc., Cincinnati, O.  
 ● Milcor Steel Co., Milwaukee, Wis.  
 National Stainless Clip Corp., New York City. (Stainless)  
 ● Osborn Co., J. M. & L. A., Cleveland, O.  
 Pfeifer, Wm., New York City.  
 Southbridge Roofing Co., Inc., Southbridge, Mass.

### CLIPS AND TIPS, DAMPER

● Adams Company, The, Dubuque, Iowa.  
 ● Air Control Products, Inc., Coopersville, Mich.  
 ● Berger Bros. Co., Philadelphia, Pa.  
 ● Gerett Co., M. A., Milwaukee.  
 Goese Mfg. Co., Milwaukee.  
 Grand Rapids Die & Tool Co., Grand Rapids, Mich.  
 Griswold Mfg. Co., Erie, Pa.  
 ● Hart & Cooley Mfg. Co., Holland, Mich.  
 Howes-Woods Company, Charlestown, Boston.  
 Kerentoff, G. L., Cincinnati.  
 ● Meyer & Bro., Co., F., Peoria, Ill.  
 ● Milcor Steel Co., Milwaukee.  
 ● Mueller Furnace Co., L. J., Milwaukee, Wis.  
 Stover Mfg. & Engine Co., Freeport, Ill.  
 Young Regulator Co., Cleveland, O.

### CO<sub>2</sub> ANALYZERS

See Analyzers, CO<sub>2</sub>

### COAL BURNERS, AUTOMATIC

See Stokers

### COATINGS, PROTECTIVE, METAL

Carey Mfg. Co., Philip, Cincinnati, Ohio.  
 Glidden Company, Cleveland.  
 Pittsburgh Plate Glass Company, Pittsburgh, Pa.  
 Tamms Silica Company, Chicago.  
 White & Co., Haydn F., Cleveland, O.

## COILS, COOLING, DIRECT EXPANSION, FINNED

Acme Industries, Inc., Jackson, Mich.  
Advanced Refrigerating Systems Co., Philadelphia.  
Aerofin Corp., Syracuse, N. Y.  
Airtemp Div., Chrysler Corp., Dayton, Ohio.  
American Coils, Inc., Newark, N. J.  
Beacon-Morris Corp., Boston, Mass.  
Bohn Aluminum & Brass, Detroit.  
Bush Mfg. Co., Hartford, Conn.  
Conditionaire Unit Co., Chicago.  
Drayer & Hanson, Inc., Los Angeles, Cal.  
Fedders Mfg. Co., Inc., Buffalo, N. Y.  
Frigidaire Div., General Motors Sales Corp., Dayton, Ohio.  
● G & O Mfg. Co., New Haven, Conn.  
● General Electric Co., Bloomfield, N. J.  
General Refrigeration Div., Yates-American Machine Co.,  
Beloit, Wis.  
Griscom-Russell Co., The, New York City.  
Kauffman Air Conditioning Corp., St. Louis, Mo.  
Kennard, Inc., Sam, St. Louis.  
Kramer Trenton Co., Trenton, N. J.  
Larkin Coils, Inc., Atlanta, Ga.  
McCord Radiator & Mfg. Co., Detroit, Mich.  
McQuay, Inc., Minneapolis, Minn.  
Manufacturer's Fin Coil Co., Chicago.  
Marlo Coil Co., St. Louis, Mo.  
Modine Mfg. Co., Racine, Wis.  
Mojonnier Brothers Co., Chicago.  
Murray Mfg. Co., D. J., Wausau, Wis.  
Niagara Blower Company, New York City.  
Peerless of America, Inc., Chicago.  
Refrigeration Appliances, Inc., Chicago, Ill.  
Refrigeration Economics Co., Inc., Canton, O.  
Rellance Refrigeration Machine Co., Chicago.  
Rempe Co., Chicago, Ill.  
Roessing Mfg. Co., Sharpsburg Sta., Pittsburgh.  
Rome-Turney Radiator Co., Rome, N. Y.  
Standard Galvanizing Co., Chicago, Ill.  
● Sturtevant Company, B. F., Hyde Park, Boston.  
Super Radiator Corp., Minneapolis.  
Tenney Engineering, Inc., Bloomfield, N. J.  
Tilco-Fin, Inc., Brooklyn, N. Y.  
Trane Co., La Crosse, Wis.  
Vilter Mfg. Co., Milwaukee, Wis.  
Wolverine Tube Co., Detroit.  
X L Refrigerating Company, Inc., Chicago.  
Yates-American Machine Co., Beloit, Wis.  
York Ice Machinery Corp., York, Pa.  
Young Radiator Co., Racine, Wis.

## COILS, COOLING, WATER

Acme Industries, Inc., Jackson, Mich.  
Advanced Refrigerating Systems Co., Philadelphia.  
Aerofin Corp., Syracuse, N. Y.  
Airtemp Div., Chrysler Corp., Dayton, Ohio.  
American Coils, Inc., Newark, N. J.  
Beacon-Morris Corp., Boston, Mass.  
Bohn Aluminum & Brass, Detroit, Mich.  
Bush Mfg. Co., Hartford, Conn.  
Campbell Heating Co., E. K., Kansas City, Mo.  
Conditionaire Unit Company, Chicago.  
Drayer & Hanson, Inc., Los Angeles.  
Fedders Mfg. Co., Inc., Buffalo, N. Y.  
Foster Wheeler Corp., New York City.  
Frigidaire Division, General Motors Sales Corporation,  
Dayton, O.  
● G & O Mfg. Co., New Haven, Conn.  
● General Electric Co., Bloomfield, N. J.  
General Refrigeration Div., Yates-American Machine Co.,  
Beloit, Wis.  
Griscom-Russell Co., The, New York City.  
Industrial Mfg. & Eng. Co., Chicago.  
Johnson Fan & Blower Corp., Chicago.  
Kauffman Air Conditioning Corp., St. Louis.  
Kennard, Inc., Sam, St. Louis.  
Kramer Trenton Co., Trenton, N. J.  
Larkin Coils, Inc., Atlanta, Ga.  
McCord Radiator & Mfg. Co., Detroit, Mich.  
McQuay, Inc., Minneapolis, Minn.  
Manufacturer's Fin Coil Co., Chicago.  
Marlo Coil Co., St. Louis, Mo.  
Modine Mfg. Co., Racine, Wis.  
Mojonnier Brothers Co., Chicago.  
Murray Mfg. Co., D. J., Wausau, Wis.  
Nesbitt, Inc., John J., Philadelphia, Pa.  
Niagara Blower Company, New York City.  
Palmer Manufacturing Corp., Phoenix, Ariz.  
Peerless of America, Inc., Chicago, Ill.  
Refrigeration Appliances, Inc., Chicago, Ill.  
Refrigeration Economics Co., Inc., Canton, O.  
Rempe Co., Chicago, Ill.  
Roessing Mfg. Co., Sharpsburg Sta., Pittsburgh.  
Rome-Turney Radiator Co., Rome, N. Y.  
Standard Galvanizing Co., Chicago, Ill.  
● Sturtevant Company, B. F., Hyde Park, Boston.  
Super Radiator Corp., Minneapolis.  
Tenney Engineering, Inc., Bloomfield, N. J.  
Tilco-Fin, Inc., Brooklyn, N. Y.  
Trane Co., La Crosse, Wis.

Vilter Mfg. Co., Milwaukee, Wis.  
Wing Manufacturing Co., L. J., New York City.  
Wolverine Tube Co., Detroit.  
X L Refrigerating Co., Inc., Chicago.  
Yates-American Machine Co., Beloit, Wis.  
York Ice Machinery Corp., York, Pa.  
Young Radiator Co., Racine, Wis.

## COILS, FIRE POT, HOT WATER

● Adams Company, The, Dubuque, Iowa.  
Air Controls, Inc., Cleveland, O.  
American Furnace & Foundry Co., Milan, Mich.  
Bell & Gossett Co., Chicago.  
● Brauer Supply Co., A. G., St. Louis.  
Deshler Foundry & Machine Works, Deshler, O.  
Devlin Mfg. Co., Thos., Burlington, N. J.  
● Dowagiac Steel Furnace Co., Dowagiac, Mich.  
● Front Rank Furnace Co., Div. Liberty Foundry Co., St.  
Louis.  
Globe Machinery & Supply Co., Des Moines, Ia.  
Harvey-Whipple, Inc., Springfield, Mass.  
Hotstream Heater Co., Cleveland, O.  
Kitson Co., Philadelphia, Pa.  
Lennox Furnace Co., Marshalltown, Ia.  
Marshall Furnace Co., Marshall, Mich.  
Melbye Bros., Inc., Chicago, Ill.  
Metzner Stove Repair Co., Kansas City, Mo.  
Miller & Son, C. Arthur, Elmira, N. Y.  
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.  
● Mueller Furnace Co., L. J., Milwaukee, Wis.  
Murray Mfg. Co., D. J., Wausau, Wis.  
National Iron Works, San Diego, Cal.  
Radiator Specialty Co., Charlotte, N. C.  
Rempe Co., Chicago, Ill.  
Rome-Turney Radiator Co., Rome, N. Y.  
Rudy Furnace Co., Dowagiac, Mich.  
Taco Heaters, Inc., New York City.

## COILS, HEATING

Aerofin Corp., Syracuse, N. Y.  
American Coils, Inc., Newark, N. J.  
● Bayley Blower Co., Milwaukee, Wis.  
Beacon-Morris Corporation, Boston, Mass.  
Bohn Aluminum & Brass, Detroit.  
Bush Mfg. Co., Hartford, Conn.  
Campbell Heating Co., E. K., Kansas City, Mo.  
Drayer & Hanson, Inc., Los Angeles.  
Fedders Mfg. Co., Inc., Buffalo.  
Foster Wheeler Corp., New York City.  
Frigidaire Division, General Motors Sales Corporation,  
Dayton, O.  
● G & O Mfg. Co., New Haven, Conn.  
● General Electric Co., Bloomfield, N. J.  
Griscom-Russell Co., New York City.  
Industrial Mfg. & Eng. Co., Chicago.  
Johnson Fan & Blower Corp., Chicago.  
Kauffman Air Conditioning Corp., St. Louis, Mo.  
Kennard, Inc., Sam, St. Louis.  
Kramer Trenton Co., Trenton, N. J.  
McCord Radiator & Mfg. Co., Detroit, Mich.  
McQuay, Inc., Minneapolis, Minn.  
Manufacturer's Fin Coil Co., Chicago.  
Marlo Coil Co., St. Louis, Mo.  
Modine Mfg. Co., Racine, Wis.  
Murray Mfg. Co., D. J., Wausau, Wis.  
Nesbitt, Inc., John J., Philadelphia, Pa.  
New York Blower Co., Chicago.  
Niagara Blower Co., New York City.  
Peerless of America, Inc., Chicago, Ill.  
Rempe Co., Chicago, Ill.  
Rome-Turney Radiator Co., Rome, N. Y.  
Super Radiator Corp., Minneapolis.  
Tenney Engineering, Inc., Bloomfield, N. J.  
Tilco-Fin, Inc., Brooklyn, N. Y.  
Trane Co., La Crosse, Wis.  
Wing Mfg. Co., L. J., New York City.  
Wolverine Tube Co., Detroit.  
Yates-American Machine Co., Beloit, Wis.  
York Ice Machinery Corp., York, Pa.  
Young Radiator Co., Racine, Wis.

## COLLECTORS, BLOW PIPE

Allen Billmyre Corp., South Norwalk, Conn.  
Allington & Curtis Mfg. Co., Saginaw, Mich.  
● American Air Filter Co., Inc., Louisville, Ky.  
American Blower Corp., Detroit.  
American Foundry Equipment Co., Mishawaka, Ind.  
● Bayley Blower Co., Milwaukee, Wis.  
Blower Application Co., Milwaukee, Wis.  
Bubar, Hudson, H., New York City.  
Buffalo Forge Co., Buffalo, N. Y.  
Clark Dust Control Company, Chicago.  
Day Co., Minneapolis, Minn.  
Dracco Corp., Cleveland, O.  
Faraday Engineering Co., Boston.  
Garden City Fan Co., Chicago, Ill.  
Goethel Co., Alfred C., Milwaukee, Wis.  
Goethel Sheet Metal Works, Alfred, Milwaukee, Wis.  
Grand Rapids Blow Pipe & Dust Arrester Co., Grand Rap-  
ids, Mich.

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Industrial Sheet Metal Works, Inc., Detroit, Mich.  
 Jacobs Co., B. & J., Cincinnati, O.  
 Kirk & Blum Mfg. Co., Cincinnati, O.  
 Kluegel & Co., E., St. Paul, Minn.  
 Knickerbocker Co., Jackson, Mich.  
 Martin Metal Mfg. Co., Wichita, Kan.  
 New York Blower Co., Chicago, Ill.  
 Northern Blower Co., Cleveland, O.  
 Pangborn Corp., Hagerstown, Md.  
 Prat-Daniel Corp., Port Chester, N. Y.  
 Puhl & Hepper Mfg. Co., Inc., St. Louis.  
 Research Corp., New York City.  
 Ruemelin Mfg. Co., Milwaukee.  
 Skinner Heating & Vent. Co., Heater Div. of St. Louis  
 Blow Pipe & Heater Co., Inc., St. Louis.  
 Sly Mfg. Co., W. W., Cleveland, O.  
 Spencer Turbine Co., Hartford, Conn.  
 Steamaire Co., Cincinnati, O.  
 Steinhurst & Sons, Inc., Emil, Utica, N. Y.  
 Strandwitz & Co., Inc., W. J., Camden, N. J.  
 • Sturtevant Co., B. F., Hyde Park, Boston, Mass.  
 Torit Manufacturing Co., St. Paul, Minn.  
 Western Blower Co., Seattle, Wash.  
 Western Precipitation Corp., Los Angeles.  
 Young & Bertke Co., Cincinnati, O.

### COMBUSTION CHAMBERS

*See Chambers, Combustion, Preformed*

### COMPOUNDS, CAULKING

Accurate Metal Weather Strip Co., New York City.  
 Acme Refining Co., Cleveland, O.  
 Acorn Refining Company, Cleveland.  
 Allmetal Weatherstrip Co., Chicago, Ill.  
 Alpha Metal & Rolling Mills, Inc., Brooklyn.  
 American Barlock Co., Inc., Long Island City, N. Y.  
 American-Marietta Company, Chicago.  
 American Metal Weather Strip Co., Grand Rapids, Mich.  
 • Armstrong Co., Detroit.  
 Asphalt Products Co., Inc., Syracuse, N. Y.  
 Barber Asphalt Corporation, Barber, N. J.  
 Barland Weatherstrip Material Co., Cleveland.  
 Calbar Paint & Varnish Co., Philadelphia, Pa.  
 Carey Co., Philip, Cincinnati, O.  
 Chamberlin Metal Weatherstrip Co., Detroit.  
 Clinton Metallic Paint Co., Clinton, N. Y.  
 Continental Products Co., Euclid, O.  
 Diamond Metal Weather Strip Co., Columbus, O.  
 Eagle-Picher Lead Co., Cincinnati, Ohio.  
 Flintkote Co., New York City.  
 Ford Roofing Products Co., Chicago.  
 Hetzel Roofing Products Co., Newark, N. J.  
 Horn Co., A. C., Long Island City, N. Y.  
 Iowa Paint Mfg. Co., Des Moines, Ia.  
 Johns-Manville, New York City.  
 Krehbiel Co., J. H., Chicago, Ill.  
 Lastik Products Co., Inc., Pittsburgh, Pa.  
 Lehon Company, Chicago.  
 Maas and Waldstein Co., Newark, N. J.  
 Metropolitan Refining Co., Long Island City, N. Y.  
 National Mfg. Corp., Tonawanda, N. Y.  
 Nebel Manufacturing Co., Cleveland.  
 North American Fibre Products Co., Cleveland.  
 Ohmlac Paint & Refining Co., Chicago, Ill.  
 Pecora Paint Co., Philadelphia, Pa.  
 Pittsburgh Plate Glass Co., Pittsburgh.  
 Plastic Products Co., Detroit, Mich.  
 Presstite Engineering Co., St. Louis.  
 Pyrolite Products Co., Cleveland, O.  
 Quigley Company, Inc., New York City.  
 Radiator Specialty Co., Charlotte, N. C.  
 Reilly Tar & Chemical Corp., Indianapolis, Ind.  
 Sipe & Company, James B., Pittsburgh.  
 Smooth-on Mfg. Co., Jersey City, N. J.  
 Southport Paint Company, Savannah, Ga.  
 Tamms Silica Company, Chicago.  
 Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.  
 Tropical Paint & Oil Co., Cleveland.  
 U. S. Stoneware Company, Akron, Ohio.  
 Wilhelm Co., A., Reading, Pa.  
 X-Pando Corp., Long Island City, N. Y.  
 Yardley Venetian Blind Co., Columbus, Ohio.

### COMPOUNDS, GLAZING

Acme Refining Co., Cleveland, O.  
 Acorn Refining Company, Cleveland.  
 American Barlock Co., Inc., Long Island City, N. Y.  
 • Armstrong Co., Detroit.  
 Calbar Paint & Varnish Co., Philadelphia, Pa.  
 Chamberlin Metal Weather Strip Co., Detroit.  
 Continental Products Co., Euclid, O.  
 Diamond Metal Weather Strip Co., Columbus, O.  
 Hetzel Roofing Products Co., Newark, N. J.  
 Horn Co., A. C., Long Island City, N. Y.  
 Lastik Products Co., Inc., Pittsburgh, Pa.  
 Nebel Manufacturing Co., Cleveland.  
 North American Fibre Products Co., Cleveland.  
 Pecora Paint Co., Philadelphia, Pa.  
 Pittsburgh Plate Glass Company, Pittsburgh.  
 Plastic Products Co., Detroit, Mich.

Presstite Engineering Co., St. Louis.  
 Pyrolite Products Co., Cleveland, O.  
 Southport Paint Co., Savannah, Ga.  
 Tamms Silica Company, Chicago.  
 Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.  
 Tropical Paint & Oil Co., Cleveland.  
 X-Pando Corporation, Long Island City, N. Y.

### COMPOUNDS, TINNING

Alpha Metal & Rolling Mills, Inc., Brooklyn.  
 American Barlock Co., Inc., Long Island City, N. Y.  
 American Solder & Flux Co., Philadelphia, Pa.  
 Burnley Battery & Mfg. Co., North East, Pa.  
 Eagle-Picher Lead Co., Cincinnati, O.  
 Lukens Metal Co., Thos. F., Philadelphia, Pa.  
 McNamee Products, Glencoe, Ill.  
 Minn-Kota Foundry & Mfg. Co., Fargo, N. Dak.  
 Motex Metal Process Corporation, Detroit.  
 Potomac Mfg. Co., Philadelphia, Pa.  
 • Ruby Chemical Co., Columbus, O.

### COMPOUNDS, WATER-PROOFING

Acorn Refining Co., Cleveland, Ohio.  
 American Barlock Co., Inc., Long Island City, N. Y.  
 Asphalt Products Co., Inc., Syracuse, N. Y.  
 Barber Asphalt Corp., Barber, N. J.  
 Barrett Division, Allied Chemical & Die Corporation, New York City.  
 Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.  
 Carey Co., Philip, Cincinnati, O.  
 Continental Products Co., Euclid, Ohio.  
 Flintkote Co., New York City.  
 Ford Roofing Products Company, Chicago.  
 Gerard Chemical Co., Elizabeth, N. J.  
 Glidden Co., The, Cleveland.  
 Hetzel Roofing Products Co., Newark, N. J.  
 Horn Co., A. C., Long Island City, N. Y.  
 Johns-Manville, New York City.  
 Koppers Co., Pittsburgh.  
 Lastik Products Co., Inc., Pittsburgh, Pa.  
 North American Fibre Products Co., Cleveland.  
 Pecora Paint Co., Philadelphia, Pa.  
 Presstite Engineering Co., St. Louis.  
 Pyrolite Products Co., Cleveland.  
 Reilly Tar & Chemical Corp., Indianapolis, Ind.  
 Robertson Co., H. H., Pittsburgh.  
 Sauereisen Cements Co., Sharpsburg, Pa.  
 Self-Vulcanizing Rubber Co., Inc., Chicago, Ill.  
 Sipe & Company, James B., Pittsburgh.  
 Smooth-On Mfg. Co., Jersey City, N. J.  
 Southport Paint Co., Savannah, Ga.  
 Technical Coatings Inc., Brooklyn, N. Y.  
 Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.  
 Wilhelm Co., A., Reading, Pa.  
 X-Pando Corp., Long Island City, N. Y.

### COMPRESSORS, REFRIGERATING

Airtemp Division Chrysler Corp., Dayton, Ohio.  
 Baker Ice Machine Co., Inc., Omaha, Nebr.  
 Brunner Mfg. Co., Utica, N. Y.  
 Carbondale Division, Worthington Pump & Machinery Corporation, Harrison, N. J.  
 Carrier Corp., Syracuse, N. Y.  
 Copeland Refrigeration Corp., Sidney, Ohio.  
 Curtis Refrigerating Machine Co., St. Louis, Mo.  
 De La Vergne Engine Co., Eddystone, Pa.  
 Diceler Corp., Greenville, Pa.  
 Fairbanks, Morse & Co., Chicago.  
 Frick Co., Waynesboro, Pa.  
 Frigidaire Division, General Motors Sales Corporation, Dayton, O.  
 Gale Products, Galesburg, Ill.  
 • General Electric Co., Bloomfield, N. J.  
 General Machinery Co., Spokane, Wash. (Ammonia).  
 General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.  
 Howe Ice Machine Co., Chicago.  
 Ingersoll-Rand, New York City.  
 Kauffman Air Conditioning Corp., St. Louis, Mo.  
 Kelvinator Div., Nash-Kelvinator Corp., Detroit.  
 Merchant & Evans Co., Philadelphia, Pa.  
 Mills Novelty Co., Chicago, Ill.  
 Nash Refrigeration Co., Inc., Newark, N. J.  
 Phoenix Ice Machine Co., Cleveland.  
 Relliance Refrigeration Machine Co., Chicago, Ill.  
 Reynolds Manufacturing Co., Springfield, Mo.  
 Servel, Inc., Evansville, Ind.  
 Standard Computing Scale Co., Air Cond. and Refrigeration Div., Detroit.  
 Starr Plano Co., Richmond, Ind.  
 Stewart Ice Machine Co., Los Angeles, Cal.  
 Tecumseh Products Co., Tecumseh, Mich.  
 Trane Co., LaCrosse, Wis.  
 Universal Cooler Corp., Marion, Ohio.  
 Vilter Mfg. Co., Milwaukee, Wis.  
 Westinghouse Electric & Mfg. Co., Springfield, Mass.  
 Williams Oil-O-Matic Heating Corp., Bloomington, Ill.  
 Wittenmeyer Machinery Co., Chicago, Ill.  
 X L Refrigerating Co., Chicago, Ill.  
 York Ice Machinery Corp., York, Pa.



## CONDUCTOR PIPE

*See Pipe, Conductor*

## CONNECTIONS, DUCT, FLEXIBLE

(Asbestos, Canvas, etc.)

- Canvas Products Co., St. Louis.
- Carpenter & Co., Geo. B., Chicago.
- Felters Co., Inc., The, Boston.
- Wilson, Inc., Grant, Chicago. (Asbestos)

## CONTROL SYSTEMS, FORCED AIR FURNACE, HAND-FIRED (PACKAGE)

(Bonnet Control of Blower)

- Barclay, Inc., Robert, Chicago.
- Cook Electric Co., Chicago.
- Detroit Lubricator Co., Detroit.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.
- Mercoid Corporation, Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis.
- Penn Electric Switch Co., Goshen, Ind.
- Pioneer Heat Regulator Div., Master Electric Co., Dayton, Ohio.
- Russell Electric Company, Chicago, Ill.
- Sampsel Time Control, Inc., Spring Valley, Ill.
- Schwab Safe Co., Lafayette, Ind.
- Spencer Thermostat Company, Attleboro, Mass.
- White Manufacturing Co., St. Paul, Minn.
- White-Rodgers Electric Co., St. Louis.

## CONTROL SYSTEMS, FORCED AIR FURNACE, HAND-FIRED (PACKAGE)

(Thermostat Control of Blower)

- Cook Electric Co., Chicago.
- Detroit Lubricator Co., Detroit.
- Friez & Sons, Julien P., Div. Bendix Avia. Corp., Baltimore.
- General Controls Co., Glendale, Cal.
- Mercoid Corp., Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis.
- Penn Electric Switch Co., Goshen, Ind.
- Russell Electric Co., Chicago.
- Sampsel Time Control, Inc., Spring Valley, Ill.
- Schwab Safe Co., Lafayette, Ind.
- Spencer Thermostat Company, Attleboro, Mass.
- White Manufacturing Co., St. Paul, Minn.
- White-Rodgers Electric Co., St. Louis.

## CONTROL SYSTEMS, GRAVITY FURNACE, HAND-FIRED (PACKAGE)

- Automatic Products Co., Milwaukee.
- Cook Electric Co., Chicago.
- Defender Automatic Regulator Co., St. Louis.
- Detroit Lubricator Co., Detroit, Mich.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.
- General Controls Co., Glendale, Cal.
- Gleason-Avery, Inc., Auburn, N. Y.
- Mercoid Corporation, Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis.
- Penn Electric Switch Co., Goshen, Ind.
- Perfex Corporation, Milwaukee.
- Pioneer Heat Regulator Div., Master Electric Co., Dayton, Ohio.
- Russell Electric Co., Chicago.
- Sampsel Time Control, Inc., Spring Valley, Ill.
- Schwab Safe Co., Lafayette, Ind.
- Spencer Thermostat Company, Attleboro, Mass.
- White Manufacturing Co., St. Paul, Minn.
- White-Rodgers Electric Co., St. Louis.

## CONTROL SYSTEMS, ZONE DISTRIBUTION, COMPLETE

- Au-Temp-Co Corp., New York City.
- Barber-Colman Company, Rockford, Ill.
- Cook Electric Co., Chicago.
- Detroit Lubricator Co., Detroit.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.
- Mercoid Corp., Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis.
- Sampsel Time Control, Inc., Spring Valley, Ill.

## CONTROLS, COMBINED FAN AND LIMIT, LINE VOLTAGE

- Defender Automatic Regulator Co., St. Louis.
- Detroit Lubricator Co., Detroit.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.
- Mercoid Corporation, Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis.
- Penn Electric Switch Co., Goshen, Ind.
- Perfex Corporation, Milwaukee.
- Pioneer Heat Regulator Div., Master Electric Co., Dayton, Ohio.
- Russell Electric Company, Chicago.

- Schwab Safe Co., Lafayette, Ind.
- United Electric Controls Co., South Boston, Mass.
- White-Rodgers Electric Co., St. Louis.

## CONTROLS, COMBINED FAN AND LIMIT, LOW VOLTAGE

- Cook Electric Co., Chicago.
- Defender Automatic Regulator Co., St. Louis.
- Detroit Lubricator Co., Detroit.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.
- McCorkle Co., D. H., Berkeley, Cal.
- Mercoid Corp., Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis.
- Penn Electric Switch Co., Goshen, Ind.
- Perfex Corporation, Milwaukee.
- Russell Electric Company, Chicago.
- Schwab Safe Co., Lafayette, Ind.
- White Manufacturing Co., St. Paul, Minn.
- White-Rodgers Electric Co., St. Louis.

## CONTROLS, COMBUSTION, BONNET OR SMOKE-PIPE, LINE VOLTAGE

- Cook Electric Co., Chicago.
- General Controls Co., Glendale, Cal.
- Hays Corp., Michigan City, Ind.
- Mercoid Corporation, Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis.
- Perfex Corporation, Milwaukee.
- Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
- Russell Electric Co., Chicago.
- Sampsel Time Control, Inc., Spring Valley, Ill.
- United Electric Controls Co., South Boston, Mass.

## CONTROLS, COMBUSTION, BONNET OR SMOKE-PIPE, LOW VOLTAGE

- Cook Electric Co., Chicago.
- Mercoid Corp., Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis.
- Penn Electric Switch Co., Goshen, Ind.
- Perfex Corporation, Milwaukee.
- Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
- Russell Electric Co., Chicago.
- Sampsel Time Control, Inc., Spring Valley, Ill.
- White Manufacturing Co., St. Paul, Minn.

## CONTROLS, EFFECTIVE TEMPERATURE

- Barber-Colman Co., Rockford, Ill.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.
- Mercoid Corp., Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Tagliabue Mfg. Co., C. J., Brooklyn.

## CONTROLS, FAN, LINE VOLTAGE

- Allen-Bradley Company, Milwaukee.
- Arrow-Hart & Hegeman Electric Co., Hartford, Conn.
- Barber-Colman Company, Rockford, Ill.
- Clark Controller Co., Cleveland.
- Cook Electric Co., Chicago.
- Detroit Lubricator Co., Detroit.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.
- General Controls Co., Glendale, Cal.
- Gleason-Avery, Inc., Auburn, N. Y.
- Hart Manufacturing Co., Hartford, Conn.
- Mercoid Corp., Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis.
- Paragon Electric Co., Chicago.
- Penn Electric Switch Co., Goshen, Ind.
- Perfex Corporation, Milwaukee.
- Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
- Ranco Inc., Columbus, O.
- Russell Electric Co., Chicago.
- Sampsel Time Control, Inc., Spring Valley, Ill.
- Sarco Company, Inc., New York City.
- Schwab Safe Co., Lafayette, Ind.
- Spencer Thermostat Co., Attleboro, Mass.
- United Electric Controls Co., South Boston, Mass.
- White-Rodgers Electric Co., St. Louis.

## CONTROLS, FAN, LOW VOLTAGE

- Allen-Bradley Company, Milwaukee, Wis.
- Arrow-Hart & Hegeman Electric Co., Hartford, Conn.
- Barber-Colman Co., Rockford, Ill.
- Clark Controller Co., Cleveland.
- Cook Electric Co., Chicago.
- Detroit Lubricator Co., Detroit.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.
- General Controls Co., Glendale, Cal.
- Gleason-Avery, Inc., Auburn, N. Y.
- McCorkle Co., D. H., Berkeley, Cal.
- Mercoid Corp., Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis.
- Penn Electric Switch Co., Goshen, Ind.
- Perfex Corporation, Milwaukee.
- Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
- Russell Electric Co., Chicago.

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- Sampsel Time Control, Inc., Spring Valley, Ill.
- Schwab Safe Co., Lafayette, Ind.
- Spencer Thermostat Co., Attleboro, Mass.
- United Electric Controls Co., South Boston, Mass.
- White Manufacturing Co., St. Paul, Minn.
- White-Rodgers Electric Co., St. Louis.

### CONTROLS, HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS, PNEUMATIC

- Atlas Valve Company, Newark, N. J.
- Bristol Co., Waterbury, Conn.
- Foxboro Co., Foxboro, Mass.
- Johnson Service Co., Milwaukee, Wis.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Powers Regulator Co., Chicago, Ill.
- Sampsel Time Control, Inc., Spring Valley, Ill.
- Tagliabue Mfg. Co., C. J., Brooklyn.
- Taylor Instrument Companies, Rochester, N. Y.

### CONTROLS, LIMIT, LINE VOLTAGE

- Allen-Bradley Co., Milwaukee, Wis.
- Cook Electric Co., Chicago, Ill.
- Detroit Lubricator Co., Detroit, Mich.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.
- General Electric Co., Schenectady, N. Y.
- Gleason-Avery, Inc., Auburn, N. Y.
- Hart Manufacturing Co., Hartford, Conn.
- Mercoird Corporation, Chicago, Ill.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Penn Electric Switch Co., Goshen, Ind.
- Perfex Corporation, Milwaukee, Wis.
- Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
- Russell Electric Co., Chicago, Ill.
- Sampsel Time Control, Inc., Spring Valley, Ill.
- Sarco Company, Inc., New York City.
- Schwab Safe Co., Lafayette, Ind.
- Spencer Thermostat Company, Attleboro, Mass.
- United Electric Controls Co., South Boston, Mass.
- White Manufacturing Co., St. Paul.
- White-Rodgers Electric Co., St. Louis, Mo.

### CONTROLS, LIMIT, LOW VOLTAGE

- Allen-Bradley Company, Milwaukee, Wis.
- Automatic Products Co., Milwaukee, Wis.
- Cook Electric Co., Chicago, Ill.
- Detroit Lubricator Co., Detroit, Mich.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.
- General Controls Co., Glendale, Cal.
- General Electric Co., Schenectady, N. Y.
- Gleason-Avery, Inc., Auburn, N. Y.
- McCorkle Co., D. H., Berkeley, Cal.
- Mercoird Corp., Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Penn Electric Switch Co., Goshen, Ind.
- Perfex Corporation, Milwaukee, Wis.
- Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
- Russell Electric Co., Chicago, Ill.
- Sampsel Time Control, Inc., Spring Valley, Ill.
- Schwab Safe Co., Lafayette, Ind.
- Spencer Thermostat Company, Attleboro, Mass.
- United Electric Controls Co., South Boston, Mass.
- White Manufacturing Co., St. Paul, Minn.
- White-Rodgers Electric Co., St. Louis, Mo.

### CONTROLS, OIL BURNER, COMPLETE ASSEMBLY

- Au-Temp-Co Corp., New York City.
- Automatic Products Co., Milwaukee.
- Defender Automatic Regulator Co., St. Louis.
- Detroit Lubricator Co., Detroit, Mich.
- General Controls Co., Glendale, Cal.
- Mercoird Corporation, Chicago, Ill.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Penn Electric Switch Co., Goshen, Ind.
- Perfex Corporation, Milwaukee, Wis.
- Schwab Safe Co., Lafayette, Ind.
- United Electric Controls Co., South Boston, Mass.

### CONTROLS, STOKER, COMPLETE ASSEMBLY

- Au-Temp-Co Corp., New York City.
- Defender Automatic Regulator Co., St. Louis.
- Detroit Lubricator Co., Detroit, Mich.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.
- Gleason-Avery, Inc., Auburn, N. Y.
- Mercoird Corporation, Chicago, Ill.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Palmer Electric Co., Chicago.
- Paragon Electric Co., Chicago.
- Penn Electric Switch Co., Goshen, Ind.
- Perfex Corporation, Milwaukee, Wis.
- Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
- Sampsel Time Control, Inc., Spring Valley, Ill.
- Schwab Safe Co., Lafayette, Ind.
- Spencer Thermostat Co., Attleboro, Mass.
- White-Rodgers Electric Co., St. Louis, Mo.

### CONTROLS, WINDOW CONDENSATION

- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.

### COOLING SURFACE

*See Coils, Cooling, Water*

### COPPERS, SOLDERING

- American Brass Company, Waterbury, Conn.
- Bernz Co., Inc., Otto, Rochester, N. Y.
- Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
- Conklin Brass & Copper Co., Inc., T. E., New York City.
- Dual Remote Control Co., Wayne, Mich.
- Electric Materials Co., North East, Pa.
- Electric Soldering Iron Co., Inc., Deep River, Conn.
- Everhot Mfg. Co., Maywood, Ill.
- Gasweld Equipment Co., Chicago, Ill. (Acetylene)
- General Electric Co., Schenectady, N. Y.
- Hexacon Electric Company, Roselle Park, N. J.
- Hussey & Co., C. G., Pittsburgh, Pa.
- Ideal Commutator Dresser Co., Sycamore, Ill.
- Imperial Brass Mfg. Co., Chicago.
- Lenk Mfg. Company, Newton Lower Falls, Mass.
- Linde Air Products Co., The, New York City.
- Minn-Kota Foundry & Mfg. Co., Fargo, N. Dak.
- Parker-Kalon Corp., New York City.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Reiner & Campbell Co., Inc., Elizabeth, N. J. (Carbide)
- Revere Copper and Brass Incorporated, New York City.
- Sheet Metal Mfg. Co., Brooklyn.
- Sight Feed Generator Co., Richmond, Ind.
- Stanley Tools, New Britain, Conn.
- Torit Manufacturing Co., St. Paul, Minn.
- Turner Brass Works, Sycamore, Ill.
- Vulcan Electric Co., Danvers, Mass.
- Weiss & Co., H., New York City.

### COUPLINGS, FLEXIBLE, POWER TRANSMISSION

- Ajax Flexible Coupling Co., Westfield, N. Y.
- Allis-Chalmers Mfg. Co., Milwaukee, Wis.
- American Flexible Coupling Co., Erie, Pa.
- Bartlett Hayward Co., Baltimore, Md.
- Blood Brothers, Allegan, Mich. (Universal joints)
- Boston Gear Wks., Inc., North Quincy, Mass.
- Caldwell Co., W. E., Louisville, Ky.
- Certified Flexible Couplings, Inc., New York, N. Y.
- Chain Belt Co., Milwaukee, Wis.
- Chicago Die Casting Co., Chicago, Ill.
- Congress Die Casting Div., Congress Tool & Die Co., Detroit.
- Continental Diamond Fibre Co., Newark, Del.
- Crocker-Wheeler Electric Mfg. Co., Ampere, N. J.
- De Laval Steam Turbine Co., Trenton, N. J.
- Diamond Chain & Mfg. Co., Indianapolis, Ind.
- Dodge Mfg. Co., Mishawaka, Ind.
- Flexo Supply Co., Inc., St. Louis, Mo.
- Guardian Utilities Co., Michigan City, Ind.
- Jones Foundry Machine Co., W. A., Chicago, Ill.
- Lewis & Co., Inc., Chas. S., St. Louis, Mo.
- Link-Belt Co., Chicago, Ill.
- Lord Mfg. Co., Erie, Pa.
- Lovejoy Flexible Coupling Co., Chicago, Ill.
- Medart Co., St. Louis, Mo.
- Mercury Clutch Corporation, Massillon, Ohio.
- Moran Flexible Steam Joint Co., Louisville, Ky.
- Morse Chain Co., Ithaca, N. Y.
- Poole Foundry & Machine Co., Baltimore, Md.
- Shallcross Co., Philadelphia, Pa.
- Smith, Inc., Winfield H., Springfield, N. Y.
- Waldron Corp., John, New Brunswick, N. J.
- Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
- Whitney Chain & Mfg. Co., The, Hartford, Conn.
- Wood's Sons Co., T. B., Chambersburg, Pa.

### CRIMPING MACHINES

*See Machines, Crimping*

### DAMPER MOTORS

*See Motors, Damper, Furnace Draft, Electrical*

### DAMPER CONTROLS

*See Regulators, Damper Sets*

### DAMPER REGULATOR SETS

*See Regulators, Damper Sets*

### DAMPERS, FOR WARM AIR PIPE

- Adams Company, Dubuque, Iowa.
- Lennox Furnace Co., Marshalltown, Ia.
- Sheet Metal Mfg. Co., Inc., Brooklyn.

### DAMPERS, SMOKE PIPE

- Adams Company, The, Dubuque, Iowa.
- Brauer Supply Co., A. G., St. Louis, Mo.
- Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
- Char-Gale Mfg. Co., Minneapolis.
- Eselgroth & Co., Newark, N. J.
- Front Rank Furnace Company, Div. Liberty Foundry Co., St. Louis.

Grand Rapids Die & Tool Co., Grand Rapids, Mich.  
 Griswold Mfg. Co., Erie, Pa.  
 Hotstream Heater Co., Cleveland.  
 Jewett Stove & Foundry Corp., Buffalo, N. Y.  
 Keith Furnace Co., Des Moines, Ia.  
 Littleford Bros., Cincinnati, O.  
 Maple City Furnace Co., Monmouth, Ill.  
 Martin Metal Mfg. Co., Wichita, Kan.  
 Metzner Stove Repair Co., Kansas City, Mo.  
 ● Meyer & Bro. Co., F., Peoria, Ill.  
 ● Milcor Steel Co., Milwaukee, Wis.  
 ● Mueller Furnace Co., L. J., Milwaukee, Wis.  
 Preferred Utilities Manufacturing Corp., New York City.  
 Royal-Apex Mfg. Corp., Brooklyn, N. Y.  
 Schoedinger, F. O., Co., Columbus, O.  
 Sheet Metal Mfg. Co., Inc., Brooklyn.  
 Stover Mfg. & Engine Co., Freeport, Ill.  
 ● United States Register Co., Battle Creek, Mich.  
 ● Walker Mfg. & Sales Corp., St. Joseph, Mo.  
 ● Williamson Heater Co., Cincinnati, O.

### DAMPERS, STACK HEAD

Controlair, Inc., Elyria, Ohio.

### DIFFUSERS, AIR, HIGH VELOCITY

Air Devices, Inc., New York City.  
 Anemostat Corporation of America, New York City.  
 Barber-Colman Company, Rockford, Ill.  
 Connor Eng. Corp., Dorex Div., New York City. (High Velocity)  
 Demuth & Sons, Charles, Jamaica, N. Y.  
 Niagara Blower Company, New York City.  
 ● Tuttle & Bailey, Inc., New Britain, Conn.  
 Waterloo Register Co., Waterloo, Ia.  
 Wilster Air Devices, Inc., Cleveland.

### DOORS, HOLLOW METAL

Advance Insulating Co., Pittsburgh.  
 American Sheet Metal Works, New Orleans, La.  
 Bayer Co., A. J., Los Angeles, Cal.  
 Biersach & Niedermeyer Co., Milwaukee, Wis.  
 Dahlstrom Metallic Door Co., Jamestown, N. Y.  
 Decatur Iron & Steel Co., Decatur, Ala.  
 Detroit Steel Products Co., Detroit.  
 Edwards Mfg. Co., Inc., Cincinnati, O.  
 International Steel Co., Evansville, Ind.  
 Maysteel Products, Inc., Mayville, Wis.  
 Metal Door & Trim Co., La Porte, Ind.  
 Newman Brothers, Inc., Cincinnati, O.  
 Perkinson & Brown, Chicago, Ill.  
 Richmond Fireproof Door Co., Richmond, Ind.  
 Truscon Steel Co., Youngstown, O.

### DOORS, KALAMEIN

American Sheet Metal Works, New Orleans, La.  
 Biersach & Niedermeyer Co., Milwaukee, Wis.  
 Cincinnati Mfg. Co., Cincinnati, O.  
 Jusing & Hunt, Inc., Buffalo.  
 Edwards Mfg. Co., Inc., Cincinnati, O.  
 Empire Door Co., Inc., New York City.  
 Herrmann & Grace Co., Brooklyn, N. Y.  
 International Steel Co., Evansville, Ind.  
 Lee & Son Co., Thomas, Cincinnati, O.  
 Mahon Co., R. C., Detroit, Mich.  
 Mesker & Co., Geo. L., Evansville, Ind.  
 Newman Brothers, Inc., Cincinnati, O.  
 Perkinson & Brown, Chicago, Ill.  
 Richmond Fireproof Door Co., Richmond, Ind.  
 Syracuse Fire Door Corp., Syracuse, N. Y.

### DOORS AND SHUTTERS, FIRE

American Sheet Metal Works, New Orleans, La.  
 Bardes Range & Foundry Co., E. H., Cincinnati, O.  
 Biersach & Niedermeyer Co., Milwaukee, Wis.  
 Cornell Iron Works, Inc., Long Island City, N. Y.  
 Detroit Steel Products Co., Detroit.  
 Dusing & Hunt, Inc., Buffalo.  
 Edwards Mfg. Co., Inc., Cincinnati, O.  
 Empire Door Co., Inc., New York City.  
 Falstrom Co., Passaic, N. J.  
 Herrmann & Grace Co., Brooklyn, N. Y.  
 International Steel Co., Evansville, Ind.  
 Jamar Co., Walker, Duluth, Minn.  
 Kinnear Mfg. Co., Columbus, O.  
 Mahon Co., R. C., Detroit, Mich.  
 Maysteel Products, Inc., Mayville, Wis.  
 Merchant & Evans Co., Philadelphia, Pa.  
 Mesker & Co., Geo. L., Evansville, Ind.  
 Perkinson & Brown, Chicago, Ill.  
 Richards-Wilcox Mfg. Co., Aurora, Ill.  
 Richmond Fireproof Door Co., Richmond, Ind.  
 Saino Mfg. Co., Inc., F. L., Memphis, Tenn.  
 Schoedinger, F. O., Co., Columbus, O.  
 Syracuse Fire Door Corp., Syracuse, N. Y.  
 Western Wire & Iron Works, Inc., Chicago, Ill.  
 ● Willis Steel Corporation, Galesburg, Ill.

### DRAFT GAGES

See Gages, Draft

### DRAFT REGULATORS

See Regulators, Furnace Draft, Mechanical

### DRILLS, ELECTRIC, PORTABLE

Black & Decker Mfg. Co., Towson, Md.  
 Buckeye Portable Tool Co., Dayton, Ohio.  
 Chicago Pneumatic Tool Co., New York City.  
 Cincinnati Electrical Tool Co., Cincinnati, O.  
 Clark, Jr., Electric Co., Jas., Louisville, Ky.  
 Duro Metal Products Co., Chicago.  
 Independent Pneumatic Tool Co., Chicago, Ill.  
 Mall Tool Co., Chicago, Ill.  
 Millers Falls Co., Greenfield, Mass.  
 Misener Mfg. Co., Inc., Syracuse, N. Y.  
 Paramount Products Co., New York City.  
 Power King Tool Corp., Warsaw, Ind.  
 Signal Electric Mfg. Co., Menominee, Mich.  
 Skillsaw, Inc., Chicago.  
 Snap-On Tools Corp., Kenosha, Wis.  
 Speedway Mfg. Co., Cicero, Ill.  
 ● Stanley Electric Tool Div., The Stanley Works, New Britain, Conn.  
 Syntron Co., Homer City, Pa.  
 United States Electrical Tool Co., Cincinnati, O.  
 Van Dorn Electric Tool Co., Towson, Md.  
 Willy's Carbide Tool Company, Detroit.  
 ● Wodack Electric Tool Corp., Chicago, Ill. (Combination hammer and drill)

### DRIVES, STOKER

Davy Fuel & Supply Co., Stoker Div., Detroit.  
 Malco Gear Co., Dolton, Ill.  
 Merkle-Korff Gear Co., Chicago.  
 Perkins Machine Gear Co., Springfield, Mass.  
 Stokerunit Corp., Milwaukee.

### DUCT CONNECTIONS

See Connections, Duct, Flexible

### DUCT INSULATION

See Insulation, Duct

### DUCT TURNING VANES

See Vanes, Duct Turning

### DUCTS AND DUCT FITTINGS, PREFABRICATED

Acer & Whedon, Inc., Medina, N. Y.  
 Acme Tin Plate and Roofing Supply Co., Philadelphia, Pa.  
 Carey Co., Philip, Cincinnati, O. (Asbestos)  
 Champion Furnace Pipe Co., Peoria, Ill.  
 ● Chandler Co., Cedar Rapids, Ia.  
 Char-Gale Mfg. Co., Minneapolis, Minn.  
 Chicago Furnace Supply Co., Chicago.  
 ● Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.  
 Corbman Bros., Inc., Philadelphia, Pa.  
 Excelsior Steel Furnace Co., Chicago, Ill.  
 Gray Metal Products, Inc., Rochester, N. Y.  
 ● Henry Furnace & Foundry Co., Cleveland, O.  
 Howes-Woods Co., Charlestown, Boston.  
 Jacobs Co., B. & J., Cincinnati.  
 ● Lamneck Products, Inc., Middletown, Ohio.  
 ● Meyer & Bro. Co., F., Peoria, Ill.  
 ● Milcor Steel Co., Milwaukee, Wis.  
 Monerief Furnace Co., Atlanta, Ga.  
 ● Mueller Furnace Co., L. J., Milwaukee.  
 Richmond Radiator Co., Inc., Uniontown, Pa.  
 Season-Aire Corporation of America, Detroit.  
 Smith-Raymond Co., Columbus, Ga.  
 ● United States Register Co., Battle Creek, Mich.  
 ● Williamson Heater Co., Cincinnati, O.  
 ● Wood Industries, Inc., Gar, Detroit.

### EAVES TROUGH FITTINGS AND ACCESSORIES

See Fittings and Accessories, Eaves Trough and Gutter

### EAVES TROUGH AND GUTTERS

American Sheet Metal Works, New Orleans, La.  
 Ames Co., W. R., San Francisco, Cal.  
 Anderson Mfg. Co., Des Moines, Ia.  
 Barnes Metal Products Co., Chicago, Ill.  
 Beatrice Steel Tank Mfg. Co., Beatrice, Nebr.  
 ● Berger Bros. Co., Philadelphia, Pa.  
 Berger Mfg. Div. of Republic Steel Corp., Canton, O.  
 Biersach & Niedermeyer Company, Milwaukee.  
 Braden Mfg. Co., Terre Haute, Ind.  
 Bridesburg Foundry Co., Philadelphia, Pa.  
 California Cornice, Steel & Supply Corp., Los Angeles.  
 Chase Brass & Copper Co., Incorporated, Waterbury, Conn.  
 Chicago Metal Mfg. Co., Chicago, Ill.  
 ● Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.  
 Downs-Smith Brass & Copper Co., New York City.  
 Edwards Mfg. Co., Inc., Cincinnati, O.  
 Globe Iron Roofing & Corrugating Co., Newport, Ky.  
 Herbert & Sons, T. L., Nashville, Tenn.  
 ● Hussey & Co., C. G., Pittsburgh, Pa.  
 Klauer Mfg. Co., Dubuque, Ia.  
 La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.  
 Lamb & Ritchie Co., Cambridge, Mass.

● Advertisement in this issue. See Index to Advertisers, page 310



Ledkote Products Co., Long Island City, N. Y.  
 Lyman Co., H. B., Southampton, Mass.  
 Lyon, Conklin & Co., Inc., Baltimore, Md.  
 Martin Metal Mfg. Co., Wichita, Kan.  
 • Milcor Steel Co., Milwaukee, Wis. (Square Hanging)  
 Miller & Doing, Inc., Brooklyn, N. Y.  
 New Delphos Manufacturing Co., Delphos, Ohio.  
 Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.  
 Northern Furnace & Supply Company, Billings, Mont.  
 • Osborn Co., J. M. & L. A., Cleveland, O.  
 Reeves Steel & Mfg. Co., Dover, O.  
 Ryniker Sheet Metal Works, Inc., Billings, Mont.  
 St. Paul Corrugating Co., St. Paul, Minn.  
 Schoedinger, F. O., Co., Columbus, O.  
 Sheet Metal Mfg. Co., Inc., Brooklyn.  
 Sheet Metal Products Co., Peoria, Ill.  
 Southern States Iron Roofing Co., Savannah, Ga.  
 Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.  
 Van Noorden Co., E., Boston, Mass.  
 Wheeling Corrugating Co., Wheeling, W. Va.  
 Williams-Wallace Co., San Francisco.  
 • Willis Steel Corporation, Galesburg, Ill.  
 Woolwine Metal Products Co., Los Angeles, Cal.  
 York Corrugating Co., York, Pa.

#### ELBOW MACHINES

*See Machines, Elbow*

#### ELBOWS, BLOW PIPE

*See Fittings, Blow Pipe*

#### ELBOWS, CONDUCTOR

*See Fittings and Accessories, Conductor*

#### ELBOWS, FURNACE PIPE

*See Fittings and Accessories, Furnace Pipe*

#### ELECTRIC WELDERS

*See Welders, Arc, Spot*

#### ELECTRODES, ARC WELDING

Air Reduction Sales Company, New York City.  
 Allegheny Ludlum Steel Corp., Pittsburgh.  
 Aluminum Company of America, Pittsburgh.  
 American Agile Corporation, Cleveland.  
 • American Brass Co., Waterbury, Conn.  
 American Steel & Wire Co., Cleveland.  
 Arcos Corp., Philadelphia, Pa.  
 Atlantic Steel Co., Atlanta, Ga.  
 Chase Brass & Copper Co., Incorporated, Waterbury, Conn.  
 Ergolyte Manufacturing Company, Philadelphia.  
 Electric Arc, Inc., Newark, N. J.  
 General Electric Co., Schenectady, N. Y.  
 Harnischfeger Corp., Milwaukee.  
 Hobart Brothers Company, Troy, Ohio.  
 Lincoln Electric Co., Cleveland, O.  
 Marquette Mfg. Co., Inc., Minneapolis, Minn.  
 Maurath, Inc., Cleveland, O.  
 McKay Co., York, Pa.  
 Metal & Thermit Corp., New York City.  
 National Cylinder Gas Co., Chicago.  
 Page Steel & Wire Div., of American Chain & Cable Co., Inc., Monessen, Pa.  
 Revere Copper and Brass Incorporated, New York City.  
 Roebbling's Sons Co., John A., Trenton, N. J.  
 Seneca Wire & Mfg. Co., Fostoria, O.  
 Torchweld Equipment Div., National Cylinder Gas Co., Chicago, Ill.  
 Trindl Products, Ltd., Chicago.  
 Una Welding, Inc., Cleveland.  
 Universal Power Corporation, Cleveland.  
 Welding Apparatus Company, Chicago.  
 Westinghouse Electric & Mfg. Co., East Pittsburgh.  
 Wilson Welder & Metals Co., Inc., New York City.

#### ENAMELS & LACQUERS

Acme White Lead & Color Works, Detroit.  
 Acorn Refining Company, Cleveland.  
 American-Marietta Company, Chicago.  
 Baer Brothers, New York City.  
 Debevoise Co., Brooklyn, N. Y.  
 Detroit Graphite Company, Detroit.  
 Devoe & Reynolds Co., Inc., New York City.  
 Dragert Company, C. H., Inc., Brooklyn, N. Y.  
 duPont de Nemours & Co., E. I., Wilmington, Del.  
 Fales Chemical Co., New York City.  
 Ferro Enamel Corporation, Cleveland.  
 Glidden Co., The, Cleveland.  
 Hague & Co., Inc., Alfred, Brooklyn, N. Y.  
 Hilo Varnish Corp., Brooklyn, N. Y.  
 Horn Co., A. C., Long Island City, N. Y.  
 Inter-Coastal Paint Co., East St. Louis, Ill.  
 Krebbiel Co., J. H., Chicago.  
 Maas & Waldstein Co., Newark, N. J.  
 O'Brien Varnish Co., South Bend, Ind.  
 Quigley Company, Inc., New York City.  
 Roxallin Flexible Lacquer Co., Inc., Elizabeth, N. J.  
 Sonneborn Sons, Inc., L., New York City.

Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.  
 Tropical Paint & Oil Co., Cleveland. (Enamel).  
 U. S. Gutta Percha Paint Co., Providence, R. I.  
 Wallis Dove-Hermiston Corp., Westfield, N. J.  
 Wattenamel Company, Summit, Illinois.  
 Wilhelm Co., A., Reading, Pa.  
 Zapon-Brevolite Division Atlas Powder Co., North Chicago, Ill.

#### EXPANSION BOLTS

*See Bolts, Expansion*

#### FACES, COLD AIR, WOOD

American Wood Register Co., Plymouth, Ind.  
 Antigo Bldg. Supply Co., Antigo, Wis.  
 Garber Lumber & Construction Co., Strasburgh, O.  
 Lockjoint Wood Products Co., Wichita, Kans.  
 Marsh Lumber Co., Inc., Dover, O.  
 McClure Builders' Supply Co., E. Palestine, O.  
 Mitchell Moulding Co., Forest Park, Ill.  
 Wooster Art Wood, Inc., Wooster, O.

#### FAN—FILTER UNITS, PROPELLER

*(Separate conversion unit for warm air furnaces)*

Air Controls, Inc., Cleveland, O.  
 • Henry Furnace & Foundry Co., Cleveland, O.  
 Peerless Electric Co., Warren, O.  
 • Utility Fan Corporation, Los Angeles.  
 Wayne Automatic Relay Co., Fort Wayne, Ind.

#### FAN HOUSINGS

*See Housings, Fan*

#### FANS, BOOSTER, COLD AIR RETURN

• A-C Mfg. Co., Pontiac, Ill.  
 Advance Aluminum Castings Corp., Chicago, Ill.  
 Aire-Folle Fan & Blower Company, Detroit, Mich.  
 Brumme Mfg. Co., Chicago, Ill.  
 Cary Mfg. Co., Waupaca, Wis.  
 Chelsea Fan & Blower Co., Inc., Irvington, N. J.  
 Economy Electric Mfg. Co., Cicero, Ill.  
 General Blower Co., Philadelphia.  
 International Engineering, Inc., Dayton, O.  
 Mauer Engineering, Evanston, Ill.  
 Peerless Electric Co., Warren, O.  
 Propellair, Inc., Springfield, O.  
 Roan Mfg. Co., Racine, Wis.  
 Universal Blower Co., Birmingham, Mich.  
 • Utility Fan Corporation, Los Angeles, Cal.

#### FANS, BOOSTER, ONE-PIPE WARM AIR

Advance Aluminum Castings Corp., Chicago.  
 Aire-Folle Fan & Blower Co., Detroit, Mich.  
 American Foundry & Furnace Co., Bloomington, Ill.  
 Brumme Mfg. Co., Chicago.  
 Chelsea Fan & Blower Co., Inc., Irvington, N. J.  
 Dual-Air Fan Corporation, Chicago.  
 Economy Electric Mfg. Co., Cicero, Ill.  
 Mauer Engineering, Evanston, Ill.  
 Midwestern Supply Co., Chicago.  
 • Mueller Furnace Co., L. J., Milwaukee.  
 Universal Blower Co., Birmingham, Mich.  
 • Victor Electric Products, Inc., Cincinnati, O.

#### FANS, FURNACE, PROPELLER TYPE

*(Complete with mounting for installation in cold air return)*

• Air Controls, Inc., Cleveland, O.  
 Autovent Fan & Blower Div., Herman Nelson Corporation, Chicago.  
 Belanger Fan & Blower Co., Detroit.  
 De Bothezat Ventilating Equipment Division, American Machine & Metals, Inc., East Moline, Ill.  
 Dual-Air Fan Corporation, Chicago.  
 Economy Electric Manufacturing Co., Cicero, Ill.  
 General Aire Company, Philadelphia.  
 • Henry Furnace & Foundry Co., Cleveland, O.  
 International Engineering, Inc., Dayton, O.  
 Johnston Co., Wm. W., Dayton, Ohio.  
 Meler Electric & Machine Co., Indianapolis, Ind.  
 Niagara Blower Company, New York City.  
 Peerless Electric Co., Warren, O.  
 Propellair, Inc., Springfield, O.  
 • Utility Fan Corporation, Los Angeles.

#### FANS, KITCHEN EXHAUST

Aire-Folle Fan & Blower Co., Detroit, Mich.  
 Airmaster Corp., Chicago, Ill.  
 Air-O-Line Co., Dallas, Texas.  
 Airtherm Mfg. Co., St. Louis.  
 • Allen Corp., Detroit, Mich.  
 American Blower Corp., Detroit, Mich.  
 American Coolair Corp., Jacksonville, Fla.  
 Arex Co., Chicago, Ill.  
 Autovent Fan & Blower Div., Herman Nelson Corporation, Chicago.  
 Barrett Engineers, Cleveland Heights, O.  
 Belanger Fan & Blower Co., Detroit.  
 Berns Specialty Co., Chicago, Ill.

Birmingham Fan Mfg. Co., Birmingham, Ala.  
 Bishop & Babcock Mfg. Co., Cleveland, O.  
 Buffalo Forge Co., Buffalo, N. Y.  
 Chelsea Fan & Blower Co., Inc., Irvington, N. J.  
 Circulators and Devices Mfg. Corp., New York City.  
 ●Clarage Fan Co., Kalamazoo, Mich.  
 Dallas Engineering Co., Inc., Dallas, Tex.  
 De Bothezat Ventilating Equipment Division, American Machine & Metals, Inc., East Moline, Ill.  
 Diehl Mfg. Co., Elizabethport, N. J.  
 Dual-Air Fan Corporation, Chicago.  
 Economy Electric Mfg. Co., Cicero, Ill.  
 Electrovent Corp., Detroit, Mich.  
 Electrovent Fan & Mfg. Co., Chicago, Ill.  
 Emerson Electric Mfg. Co., St. Louis, Mo.  
 Garden City Fan Co., Chicago, Ill.  
 General Aire Company, Philadelphia.  
 General Blower Co., Philadelphia, Pa.  
 Hirschman Co., Inc., W. F., Buffalo, N. Y.  
 ●Ilg Electric Ventilating Co., Chicago, Ill.  
 International Engineering, Inc., Dayton, O.  
 King Ventilating Co., Owatonna, Minn.  
 Lohman, Inc., Wm. J., Irvington, N. J.  
 Marathon Electric Mfg. Corp., Wausau, Wis.  
 Meyer Manufacturing Co., Detroit.  
 Myers Electric Co., Pittsburgh, Pa.  
 New York Blower Co., Chicago, Ill.  
 Peerless Electric Co., Warren, O.  
 Propellair, Inc., Springfield, O.  
 Pryne & Co., Inc., Los Angeles, Cal.  
 Reed Unit-Fans, Inc., New Orleans, La.  
 Reynolds Electric Company, Chicago.  
 Roto-Beam Div., Peerless of America, Inc., Chicago.  
 Shreveport Engineering Co., Inc., Shreveport, La.  
 Signal Electric Mfg. Co., Menominee, Mich.  
 Skinner Heating & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.  
 Smith Manufacturing Company, Inc., F. A., Rochester, N. Y.  
 ●Sturtevant Co., B. F., Hyde Park, Boston, Mass.  
 Universal Blower Co., Birmingham, Mich.  
 ●U. S. Air Conditioning Corp., Minneapolis, Minn.  
 ●Victor Electric Products, Inc., Cincinnati, O.  
 Wagner Electric Corp., St. Louis, Mo.  
 Ward Mfg. Co., Plymouth, Mich.  
 Western Blower Co., Seattle, Wash.

#### FANS, NIGHT AIR COOLING, COMPLETE UNIT

Air Controls, Inc., Cleveland, O.  
 Aire-Folle Fan & Blower Co., Detroit, Mich.  
 Airmaster Corp., Chicago, Ill.  
 Air-O-Line Co., Dallas, Tex.  
 ●Alco Manufacturing Co., Houston, Tex.  
 ●Allen Corporation, Detroit, Mich.  
 American Blower Corp., Detroit, Mich.  
 American Coolair Corp., Jacksonville, Fla.  
 Associated Southern Industries, Memphis, Tenn.  
 Autovent Fan & Blower Div., Herman Nelson Corporation, Chicago.  
 Barrett Engineers, Cleveland Heights, O.  
 Belanger Fan & Blower Co., Detroit, Mich.  
 Belco Exhaust Fan Mfg. Co., St. Louis.  
 Birmingham Fan Mfg. Co., Birmingham, Ala.  
 Bryant Heater Co., Cleveland.  
 Buffalo Forge Co., Buffalo, N. Y.  
 Chelsea Fan & Blower Co., Inc., Irvington, N. J.  
 Circulators & Devices Mfg. Corp., New York City.  
 Dallas Engineering Co., Inc., Dallas, Tex.  
 DeBothezat Ventilating Eq. Div., American Machine & Metals, Inc., East Moline, Illinois.  
 Diehl Mfg. Co., Elizabethport, N. J.  
 Dual-Air Fan Corporation, Chicago.  
 Economy Electric Mfg. Co., Cicero, Ill.  
 Electrovent Fan & Mfg. Co., Chicago, Ill.  
 Emerson Electric Mfg. Co., St. Louis, Mo.  
 Esko Mfg. Corp., Houston, Tex.  
 Forker Corporation, Cleveland.  
 Fresh'nd-Aire Co., Chicago.  
 General Aire Company, Philadelphia.  
 General Blower Co., Philadelphia, Pa.  
 Hall Manufacturing Co., Cedar Rapids, Iowa.  
 Hartzell Propeller Fan Co., Piqua, O.  
 Herbert & Son, T. L., Nashville, Tenn.  
 Hirschman Co., Inc., W. F., Buffalo, N. Y.  
 Hunter Fan & Ventilating Co., Memphis, Tenn.  
 ●Ilg Electric Ventilating Co., Chicago, Ill.  
 International Engineering, Inc., Dayton, O.  
 Jaden Manufacturing Co., F. Hastings, Nebr.  
 Jamieson Mfg. Co., Dallas, Tex.  
 Johnson Fan & Blower Corp., Chicago, Ill.  
 Jordan & Co., Paul R., Indianapolis, Ind.  
 Kelley Mfg. Co., Houston, Tex.  
 King Ventilating Co., Owatonna, Minn.  
 ●Lau Blower Co., Dayton, O.  
 Lohman, Inc., William J., Irvington, N. J.  
 Marathon Electric Mfg. Corp., Wausau, Wis.  
 Meier Electric & Machine Co., Indianapolis, Ind.  
 Murray Co., Dallas, Tex.  
 New York Blower Co., Chicago, Ill.  
 Palmer Manufacturing Corp., Phoenix, Ariz.  
 Peerless Electric Co., Warren, O.  
 Preferred Utilities Mfg. Corp., New York City.

Propellair, Inc., Springfield, O.  
 Reed Unit-Fans, Inc., New Orleans, La.  
 Reynolds Electric Co., Chicago.  
 Roto-Beam Div., Peerless of America, Chicago.  
 ●Schwitzer-Cummins Co., Indianapolis, Ind.  
 Shreveport Engineering Co., Inc., Shreveport, La.  
 Skinner Heating & Ventilating Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.  
 South Bend Air Products, Inc., South Bend, Ind.  
 ●Sturtevant Co., B. F., Hyde Park, Boston, Mass.  
 Todd Air Conditioning Co., Inc., Bonner Springs, Kan.  
 Universal Blower Co., Birmingham, Mich.  
 U. S. Air Conditioning Corp., Minneapolis, Minn.  
 ●Utility Fan Corporation, Los Angeles, Cal.  
 U. S. Machine Corporation, Lebanon, Ind.  
 ●Victor Electric Products, Inc., Cincinnati, O.  
 Viking Air Conditioning Corp., Cleveland, O.  
 Vulcan Metal Products Co., Birmingham, Ala.  
 Wagner Electric Corp., St. Louis.  
 Ward Co., Edgar T., River Forest, Ill.  
 Western Blower Co., Seattle, Wash.  
 Wind-Way Fan & Ventilating Co., Inc., New Orleans.  
 ●Wood Industries, Inc., Gar, Detroit, Mich.

#### FANS, VENTILATING, PROPELLER TYPE (Capacity 4,000 c.f.m. up)

Aerovent Fan Co., Piqua, O.  
 Air Controls, Inc., Cleveland, O.  
 Aire-Folle Fan & Blower Co., Detroit, Mich.  
 Airmaster Corp., Chicago, Ill.  
 Air-O-Line Co., Dallas, Tex.  
 Airtherm Manufacturing Co., St. Louis, Mo.  
 ●Alco Manufacturing Co., Houston, Tex.  
 ●Allen Corp., Detroit, Mich.  
 American Blower Corp., Detroit, Mich.  
 American Coolair Corp., Jacksonville, Fla.  
 Arex Co., Chicago, Ill.  
 Autovent Fan & Blower Div., Herman Nelson Corporation, Chicago.  
 Barrett Engineers, Cleveland Heights, O.  
 ●Bayley Blower Co., Milwaukee, Wis.  
 Belanger Fan & Blower Co., Detroit, Mich.  
 Belco Exhaust Fan Mfg. Co., St. Louis.  
 Bishop & Babcock Mfg. Co., Cleveland, O.  
 Buffalo Forge Co., Buffalo, N. Y.  
 C. & H. Air Conditioning Fan Co., Inc., Atlanta, Ga.  
 Champion Blower & Forge Co., Lancaster, Pa.  
 Chelsea Fan & Blower Co., Inc., Irvington, N. J.  
 Circulators & Devices Mfg. Corp., New York City.  
 ●Clarage Fan Co., Kalamazoo, Mich.  
 Dallas Eng. Co., Inc., Dallas, Tex.  
 De Bothezat Ventilating Equipment Division, American Machine & Metals, Inc., East Moline, Ill.  
 Diehl Mfg. Co., Elizabethport, N. J.  
 Dual-Air Fan Corporation, Chicago.  
 Duriron Co., Inc., Dayton, O. (Acid Resisting).  
 Economy Electric Mfg. Co., Cicero, Ill.  
 Electrovent Fan & Mfg. Co., Chicago, Ill.  
 Emerson Electric Mfg. Co., St. Louis, Mo.  
 Esko Mfg. Corp., Houston, Tex.  
 Fresh'nd-Aire Co., Chicago, Ill.  
 Garden City Fan Co., Chicago, Ill.  
 General Aire Company, Philadelphia.  
 General Blower Co., Philadelphia, Pa.  
 ●General Electric Co., Bloomfield, N. J.  
 Grand Rapids Blow Pipe and Dust Arrester Co., Grand Rapids, Mich.  
 Hall Mfg. Co., Cedar Rapids, Ia.  
 Hartzell Propeller Fan Co., Piqua, O.  
 Herbert & Sons, T. L., Nashville, Tenn.  
 Hirschman Co., Inc., W. F., Buffalo, N. Y.  
 Hunter Fan & Ventilating Co., Memphis, Tenn.  
 ●Ilg Electric Ventilating Co., Chicago, Ill.  
 International Engineering, Inc., Dayton, O.  
 Johnson Fan & Blower Corp., Chicago, Ill.  
 Johnston & Co., Wm. W., Dayton, O.  
 Jordan & Co., Paul R., Indianapolis, Ind.  
 King Ventilating Co., Owatonna, Minn.  
 ●Lau Blower Co., Dayton, O.  
 Lohman, Inc., Wm. J., Irvington, N. J.  
 Marathon Electric Mfg. Corp., Wausau, Wis.  
 McCord Radiator & Mfg. Co., Detroit.  
 Meier Electric & Machine Co., Indianapolis, Ind.  
 Mountain States Equipment Co., Denver, Colo.  
 Myers Electric Co., Pittsburgh, Pa.  
 New York Blower Co., Chicago, Ill.  
 Palmer Manufacturing Corp., Phoenix, Ariz.  
 Peerless Electric Co., Warren, O.  
 Perkins & Son, Inc., B. F., Holyoke, Mass.  
 Phelps Mfg. Co., Little Rock, Ark.  
 Propellair, Inc., Springfield, O.  
 Reed Unit-Fans, Inc., New Orleans, La.  
 Reynolds Electric Company, Chicago.  
 Roto-Beam Div., Peerless of America, Inc., Chicago.  
 ●Schwitzer-Cummins Co., Indianapolis, Ind.  
 Shreveport Engineering Co., Inc., Shreveport, La.  
 Signal Electric Mfg. Co., Menominee, Mich.  
 Skinner Heating & Ventilating Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.  
 South Bend Air Products, Inc., South Bend, Ind.

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Spartan Electric Company, Rochester, N. Y.  
 Steamaire Co., Cincinnati, Ohio.  
 ●Sturtevant Co., B. F., Hyde Park, Boston, Mass.  
 Truffo Fan Co., Harmony, Pa.  
 ●U. S. Air Conditioning Corp., Minneapolis, Minn.  
 U. S. Machine Corporation, Lebanon, Ind.  
 ●Utility Fan Corporation, Los Angeles, Cal.  
 ●Victor Electric Products, Inc., Cincinnati, O.  
 Viking Air Conditioning Corp., Cleveland, O.  
 Ward Co., Inc., Edgar T., River Forest, Ill.  
 Ward Mfg. Co., Plymouth, Mich.  
 Western Blower Co., Seattle, Wash.  
 Western Engineering & Mfg. Co., Los Angeles, Cal.  
 Wind-Way Fan & Ventilator Co., Inc., New Orleans.  
 Wing Mfg. Co., L. J., New York City.

#### FANS, WINDOW VENTILATING

Air Controls, Inc., Cleveland.  
 Airmaster Corp., Chicago.  
 Airmode Mfg. Co., Chicago.  
 ●Alco Manufacturing Co., Houston, Tex.  
 American Blower Corporation, Detroit.  
 American Coolair Corp., Jacksonville, Fla.  
 American Metal Products Co., Fort Worth, Tex.  
 Autovent Fan & Blower Div., Herman Nelson Corporation, Chicago.  
 Buffalo Forge Co., Buffalo, N. Y.  
 Chelsea Fan & Blower Co., Inc., Irvington, N. J.  
 Dallas Engineering Co., Inc., Dallas, Tex.  
 Diehl Mfg. Company, Elizabethport, N. J.  
 Dual-Air Fan Corporation, Chicago.  
 Esko Manufacturing Corp., Houston, Tex.  
 Fresh'nd-Aire Company, Chicago.  
 General Aire Company, Philadelphia.  
 General Blower Company, Philadelphia.  
 Hall Manufacturing Co., Cedar Rapids, Iowa.  
 ●Lau Blower Co., Dayton, Ohio.  
 Lohman, Inc., Wm. J., Irvington, N. J.  
 Meier Electric and Machine Co., Indianapolis, Ind.  
 Peerless Electric Co., Warren, Ohio.  
 Reed Unit-Fans, Inc., New Orleans, La.  
 Roto-Beam Div., Peerless of America, Inc., Chicago.  
 Shreveport Engineering Co., Inc., Shreveport, La.  
 ●Sturtevant Co., B. F., Hyde Park, Boston, Mass.  
 ●Utility Fan Corporation, Los Angeles.  
 ●Victor Electric Products, Inc., Cincinnati, Ohio.  
 Viking Air Conditioning Corporation, Cleveland.  
 Wagner Electric Corporation, St. Louis.  
 Ward Co., Inc., Edgar T., River Forest, Ill.  
 Ward Mfg. Co., Plymouth, Mich.  
 Wind-Way Fan & Ventilator Co., Inc., New Orleans.

#### FASTENINGS, SPRING STEEL

Tinnerman Products, Inc., Cleveland.

#### FILTERS, AIR, AUTOMATIC

Air Stream Filter Corp., St. Louis.  
 Air & Refrigeration Corp., New York City.  
 ●American Air Filter Co., Inc., Louisville, Ky.  
 ●Brauer Supply Co., A. G., St. Louis.  
 Staynew Filter Corp., Rochester, N. Y.  
 Westinghouse Electric & Mfg. Co., Cleveland. (Electrostatic Precipitator)

#### FILTERS, AIR, UNIT, CLEANABLE

●Air Maze Corp., Cleveland, O.  
 Air Stream Filter Corp., St. Louis.  
 ●American Air Filter Co., Inc., Louisville, Ky. (Steel wool).  
 Amirton Co., Inc., 27 Pearl St., New York City.  
 Annis Air Filters, Glendale, Cal.  
 Badger Mfg. & Sales Co., Milwaukee. (Steel Wool)  
 ●Brauer Supply Co., A. G., St. Louis.  
 ●Chicago Filter Co., Joliet, Ill.  
 Coppus Engineering Corp., Worcester, Mass.  
 Davies Air Filter Corp., New York, N. Y.  
 Hugo Mfg. Co., West Duluth, Minn.  
 Kauffman Air Conditioning Corp., St. Louis.  
 Kleenaire Corp., Stevens Point, Wis.  
 Somers, Inc., H. J., Detroit, Mich. (Hair, Glass)  
 Staynew Filter Corp., Rochester, N. Y. (Feltex, Glastex, heat resistant cotton)  
 Supreme Air Filter Co., New York City.  
 Tuttle Air Filter Co., Inc., Louisville, Ky. (Split wire fiber)  
 Universal Air Filter Corp., Duluth, Minn.

#### FILTERS, AIR, UNIT, THROWAWAY

●American Air Filter Co., Inc., Louisville, Ky.  
 Amirton Co., Inc., 27 Pearl St., New York City.  
 Anderson Products, Inc., Cambridge, Mass.  
 ●Blocksom & Company, Michigan City, Ind. (Flame proof curled fibre and hair)  
 ●Chicago Filter Co., Joliet, Ill.  
 Davies Air Filter Corp., New York City.  
 ●Detroit Lubricator Co., Detroit.  
 Gehri Company, Tacoma, Wash. (Viscous)  
 Kleenaire Corp., Stevens Point, Wis.  
 Owens-Corning Fiberglas Corp., Toledo, O.

Plymouth Cordage Co., N. Plymouth, Mass. (Anderson Products, Inc., Cambridge, Mass., National Sales Agents)  
 ●Research Products Corp., Madison, Wis. (Expanded flame-proofed kraft fibre)  
 Staynew Filter Corp., Rochester, N. Y. (Feltex, Glastex and heat resistant cotton)  
 Universal Air Filter Corp., Duluth, Minn.  
 Wilson & Co., Inc., Chicago, Ill.  
 Zimmerman, R. F., Cincinnati, Ohio. (Gravity Cold Air)

#### FIRE BRICK See Refractories

#### FIRING TOOLS See Tools, Firing

#### FITTINGS AND ACCESSORIES, CONDUCTOR

(Elbows, Heads, Hooks, Shoes, Straps, etc.)

Allred Manufacturing Co., Inc., Indianapolis, Ind.  
 Ames Co., W. R., San Francisco.  
 Barnes Metal Products Co., Chicago, Ill.  
 ●Berger Bros. Co., Philadelphia, Pa.  
 Berger Mfg., Div. of Republic Steel Corp., Canton, O.  
 Braden Mfg. Co., Terre Haute, Ind.  
 Chase Brass & Copper Co., Incorporated, Waterbury, Conn.  
 Chicago Metal Mfg. Co., Chicago, Ill.  
 ●Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.  
 Crary Mfg. Co., Middleport, O. (Cut-off.)  
 Dieckmann Co., Ferdinand, Cincinnati, O.  
 Downs-Smith Brass & Copper Co., New York City.  
 Edwards Mfg. Co., Inc., Cincinnati, O.  
 Globe Iron Roofing & Corrugating Co., Newport, Ky.  
 Gray Metal Products, Inc., Rochester, N. Y.  
 ●Hussey & Co., C. G., Pittsburgh, Pa.  
 Iwan Bros., South Bend, Ind.  
 Jelliff Mfg. Corp., C. O., Southport, Conn.  
 Klauer Mfg. Co., Dubuque, Ia.  
 La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.  
 Lamb & Ritchie Co., Cambridge, Mass.  
 ●Levow, David, New York City.  
 Lyon, Conklin & Co., Inc., Baltimore, Md.  
 Martin Metal Mfg. Co., Wichita, Kan.  
 Maysteel Products, Inc., Mayville, Wis.  
 ●Milcor Steel Co., Milwaukee, Wis.  
 New Delphos Manufacturing Co., Delphos, Ohio.  
 Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.  
 ●Osborn Co. J. M. & L. A., Cleveland, O.  
 Rival Strap Corp., New York City. (Ornamental Conductor Straps)  
 Royal-Apex Mfg. Corp., Brooklyn, N. Y.  
 Schoedinger Co., F. O., Columbus, O.  
 Sheet Metal Mfg. Co., Inc., Brooklyn.  
 Sheet Metal Products Co., Peoria, Ill.  
 Stewart Foundry, O. S., Cleveland, O. (Iron Conductor Shoes)  
 Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.  
 Wheeling Corrugating Co., Wheeling, W. Va.  
 Williams-Wallace Co., San Francisco.  
 ●Willis Steel Corporation, Galesburg, Ill.  
 Woolwine Metal Products Co., Los Angeles, Cal.

#### FITTINGS AND ACCESSORIES, EAVES TROUGH AND GUTTER

(Hangers, Strainers, Mitters, Ends, Thimbles, etc.)

Abbott Mfg. Co., Painesville, O. (Hangers)  
 Ames Co., W. R., San Francisco.  
 Barnes Metal Products Co., Chicago, Ill.  
 ●Berger Bros. Co., Philadelphia, Pa.  
 Berger Mfg., Div. of Republic Steel Corp., Canton, O.  
 Bertram Mfg. Co., Chicago, Ill.  
 Boyd & Co., Inc., Charles P., Philadelphia.  
 Braden Mfg. Co., Terre Haute, Ind.  
 Chase Brass & Copper Co., Incorporated, Waterbury, Conn.  
 Chicago Metal Mfg. Co., Chicago, Ill.  
 ●Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.  
 Downs-Smith Brass & Copper Co., New York City.  
 Eav-Tex Company, Upper Darby, Pa. (Roof Gutter Protection)  
 Edwards Mfg. Co., Inc., Cincinnati, O.  
 Globe Iron Roofing & Corrugating Co., Newport, Ky.  
 Grand Rapids Wire Products Co., Grand Rapids, Mich.  
 Gray Metal Products, Inc., Rochester, N. Y.  
 Herbert & Sons, T. L., Nashville, Tenn.  
 ●Hussey & Co., C. G., Pittsburgh, Pa. (Copper)  
 Iwan Brothers, South Bend, Ind.  
 Juniper Elbow Company, Inc., Middle Village, N. Y.  
 Klauer Mfg. Co., Dubuque, Ia.  
 La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.  
 Lamb & Ritchie Co., Cambridge, Mass.  
 Ledkote Products Co., Long Island City, N. Y.  
 ●Levow, David, New York City.  
 Lyon, Conklin & Co., Inc., Baltimore, Md.  
 Martin Metal Mfg. Co., Wichita, Kan.  
 ●Milcor Steel Co., Milwaukee, Wis.  
 New Delphos Manufacturing Co., Delphos, Ohio.  
 New Way Products Company, Toledo. (Eaves Trough Shield)



Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.  
Ohio Wire Products Co., Dover, O. (Hangers)  
● Osborn Co., J. M. & L. A., Cleveland, O.  
Reeves Steel & Mfg. Co., Dover, O.  
Royal-Apex Mfg. Corp., Brooklyn, N. Y.  
St. Paul Corrugating Co., St. Paul, Minn.  
Schoedinger, F. O., Columbus, Ohio.  
Sheet Metal Mfg. Co., Inc., Brooklyn.  
Sheet Metal Products Co., Peoria, Ill.  
Snap-On Mfg. Co., Chicago, Ill. (Hangers)  
Southern States Iron Roofing Co., Savannah, Ga.  
Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.  
U. S. Cistern Filter Mfg. Co., Bloomington, Ill.  
Wheeling Corrugating Co., Wheeling, W. Va.  
Williams-Wallace Co., San Francisco.  
● Willis Steel Corporation, Galesburg, Ill.  
Woolwine Metal Products Co., Los Angeles, Cal.

## FITTINGS AND ACCESSORIES, FURNACE PIPE

(Angles, Boots, Elbows, Heads, Joints, Offsets, Tees, etc.)

Acer & Whedon, Inc., Medina, N. Y.  
Acme Tin Plate & Roofing Supply Co., Philadelphia, Pa.  
Adelta Manufacturing Co., Philadelphia.  
Arcweld Manufacturing Co., Inc., Seattle, Wash.  
Armstrong Furnace Company, Columbus, Ohio.  
Atlas Heating & Ventilating Co., Ltd., San Francisco, Cal.  
Bergstrom Mfg. Corp., Neenah, Wis.  
Braden Mfg. Co., Terre Haute, Ind.  
Campbell Heating Co., Des Moines, Ia.  
Cary Mfg. Co., Waupaca, Wis.  
Champion Furnace Pipe Co., Peoria, Ill.  
Char-Gale Mfg. Co., Minneapolis.  
Chicago Metal Mfg. Co., Chicago, Ill.  
● Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.  
Cincinnati Stamping Co., Cincinnati, O.  
Corbman Bros., Inc., Philadelphia, Pa.  
Detroit Safety Furnace Pipe Co., Detroit, Mich.  
Excelsior Steel Furnace Co., Chicago, Ill.  
Excelsior Stove & Mfg. Co., Quincy, Ill.  
Farquhar Furnace Co., Wilmington, O.  
Fraser and Johnston Co., San Francisco.  
Gray Metal Products, Inc., Rochester, N. Y.  
Green Colonial Furnace Co., Des Moines, Ia.  
● Henry Furnace & Foundry Co., Cleveland, O.  
Herbert & Sons, T. L., Nashville, Tenn.  
● Homer Furnace & Foundry Corp., Coldwater, Mich.  
Howe & Bassett Co., Inc., Rochester, N. Y. (Boots)  
● Howes-Woods Company, Charlestown, Boston.  
International Heater Co., Utica, N. Y.  
Juniper Elbow Company, Inc., Middle Village, N. Y.  
Keith Furnace Company, Des Moines, Iowa.  
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.  
(Elbows and pipe only.)  
● Lamneck Products, Inc., Middletown, Ohio.  
Lennox Furnace Co., Marshalltown, Ia.  
Lyman Co., H. B., Southampton, Mass.  
Lyon, Conklin & Co., Inc., Baltimore, Md.  
Majestic Co., Huntington, Ind.  
Maple City Furnace Co., Monmouth, Ill.  
Marshall Furnace Co., Marshall, Mich.  
Martin Metal Mfg. Co., Wichita, Kan.  
● Meyer & Bro. Co., F., Peoria, Ill.  
● Milcor Steel Co., Milwaukee, Wis.  
Monarch Furnace Fittings Manufacturers, Chicago, Ill.  
Montag Stove & Furnace Works, Portland, Ore.  
● Mueller Furnace Co., L. J., Milwaukee, Wis.  
● Osborn Co., J. M. & L. A., Cleveland, O.  
● Pacific Gas Radiator Co., Huntington Park, Cal.  
Parkersburg Iron & Steel Co., Parkersburg, W. Va.  
● Payne Furnace & Supply Co., Beverly Hills, Cal.  
● Peerless Foundry Co., Indianapolis, Ind.  
Portland Stove Foundry Co., Portland, Me.  
● Premier Furnace Company, Dowagiac, Mich.  
Reeves Steel & Mfg. Co., Dover, O.  
Roberts-Hamilton Co., Minneapolis, Minn.  
● Rock Island Register Co., Rock Island, Ill.  
Schechter Brothers Co., Philadelphia, Pa.  
Schoedinger, F. O., Columbus, Ohio.  
Sheet Metal Specialty Co., Pittsburgh, Pa.  
Sheet Metal Mfg. Co., Inc., Brooklyn.  
Standard Furnace & Supply Co., Omaha, Nebr.  
Stratton & Terstegge Co., Louisville, Ky.  
Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.  
● United States Register Co., Battle Creek, Mich.  
● Waterman-Waterbury Co., Minneapolis.  
Waverly Heating Supply Co., Boston.  
Wheeling Corrugating Co., Wheeling, W. Va.  
● Williamson Heater Co., Cincinnati, O.

## FITTINGS AND ACCESSORIES, SMOKE PIPE

(Draw-bands, Clean-outs, Collars, Tees, etc.)

Acer & Whedon, Inc., Medina, N. Y.  
Acme Tin Plate & Roofing Supply Co., Philadelphia, Pa.  
Arcweld Manufacturing Co., Inc., Seattle, Wash.  
Armstrong Furnace Company, Columbus, Ohio.  
Atlas Heating & Ventilating Co., Ltd., San Francisco, Cal.  
Bardes Range & Foundry Co., E. H., Cincinnati, O.  
Bergstrom Mfg. Corp., Neenah, Wis.

Braden Mfg. Co., Terre Haute, Ind.  
● Brauer Supply Co., A. G., St. Louis, Mo.  
Cary Mfg. Co., Waupaca, Wis.  
Champion Furnace Pipe Co., Peoria, Ill.  
Char-Gale Mfg. Co., Minneapolis.  
Chicago Metal Mfg. Co., Chicago, Ill.  
● Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.  
Cincinnati Stamping Co., Cincinnati, O.  
Corbman Bros., Inc., Philadelphia.  
Detroit Safety Furnace Pipe Co., Detroit, Mich.  
Excelsior Steel Furnace Co., Chicago, Ill.  
Green Colonial Furnace Co., Des Moines, Ia.  
● Henry Furnace & Foundry Co., Cleveland, O.  
Herbert & Sons, T. L., Nashville, Tenn.  
● Homer Furnace & Foundry Corporation, Coldwater, Mich.  
Howes-Woods Company, Charlestown, Boston.  
International Heater Co., Utica, N. Y.  
Keith Furnace Company, Des Moines, Ia.  
Kirk & Blum Mfg. Co., Cincinnati, Ohio.  
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.  
● Lamneck Products, Inc., Columbus, Ohio.  
Lennox Furnace Co., Marshalltown, Ia.  
Lyman Co., H. B., Southampton, Mass.  
Lyon, Conklin & Co., Inc., Baltimore, Md.  
Majestic Co., Huntington, Ind.  
Maple City Furnace Co., Monmouth, Ill.  
Marshall Furnace Co., Marshall, Mich.  
Martin Metal Co., Wichita, Kan.  
● Meyer & Bro. Co., F., Peoria, Ill.  
● Milcor Steel Co., Milwaukee, Wis.  
Montag Stove & Furnace Works, Portland, Ore.  
● Mueller Furnace Co., L. J., Milwaukee, Wis.  
● Osborn Co., J. M. & L. A., Cleveland, O.  
● Patten Co., J. V., Sycamore, Ill.  
Peacard Co., M. A., Boston.  
● Peerless Foundry Co., Indianapolis, Ind.  
Portland Stove Foundry Co., Portland, Me.  
● Premier Furnace Company, Dowagiac, Mich.  
Reeves Steel & Mfg. Co., Dover, O.  
Roberts-Hamilton Co., Minneapolis, Minn.  
● Rock Island Register Co., Rock Island, Ill.  
Schechter Brothers Co., Philadelphia, Pa.  
Schoedinger, F. O., Columbus, O.  
Sheet Metal Mfg. Co., Inc., Brooklyn.  
Skinner Heating & Ventilating Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.  
Standard Furnace & Supply Co., Omaha, Nebr.  
Stratton & Terstegge Co., Louisville, Ky.  
Tierney Rotor Ventilator Co., Minneapolis, Minn.  
Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.  
● United States Register Co., Battle Creek, Mich.  
● Waterman-Waterbury Co., Minneapolis.  
Waverly Heating Supply Co., Boston.  
Wheeling Corrugating Co., Wheeling, W. Va.  
Wilder Manufacturing Co., Niles, O.  
● Williamson Heater Co., Cincinnati, O.

## FITTINGS, BLOW PIPE

(Elbows, Flanges, Hangers, Hoods and Sweeps, Joints, Rings, Tubing)

Acer & Whedon, Inc., Medina, N. Y.  
Allington & Curtis Mfg. Co., Saginaw, Mich.  
Chicago Metal Mfg. Co., Chicago, Ill.  
● Cincinnati Sheet Metal & Roofing Co., Cincinnati.  
Day Co., Minneapolis, Minn.  
Falstrom Co., Passaic, N. J.  
Goethel Co., Alfred C., Milwaukee, Wis.  
Goethel Sheet Metal Works, Alfred, Milwaukee, Wis.  
Grand Rapids Blow Pipe & Dust Arrester Co., Grand Rapids, Mich.  
Industrial Sheet Metal Works, Inc., Detroit, Mich.  
Kirk & Blum Mfg. Co., Cincinnati, O. (Adjustable Buffing Hoods)  
Lee & Son Co., Thomas, Cincinnati, O.  
Mahon Co., R. C., Detroit, Mich.  
● Meyer & Bro. Co., F., Peoria, Ill.  
Puhl & Hepper Mfg. Co., Inc., St. Louis.  
Schmieg Sheet Metal Works, Detroit.  
Skinner Heating & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.  
Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.  
● United States Register Co., Battle Creek, Mich.  
Western Blower Co., Seattle, Wash.  
Young & Bertke Co., Cincinnati, O.

## FITTINGS, HUMIDIFIER, WATER LINE

● American Brass Co., Waterbury, Conn.  
Hays Mfg. Co., Erie, Pa.  
● McDonnell & Miller, Chicago.  
● Maid-O'-Mist, Inc., Chicago, Ill.  
● Monmouth Products Co., Cleveland, O.  
Reichert Float & Mfg. Co., Toledo, O.  
Rockford Brass Works, Rockford, Ill.  
Scovill Mfg. Co., Morency-Van Buren Div., Sturgis, Mich.  
● Skuttle Sales Co., Detroit.  
Streamline Pipe & Fittings Div., Mueller Brass Co., Port Huron, Mich.  
Weatherhead Co., Cleveland, O.

● Advertisement in this issue. See Index to Advertisers, page 310

## FLANGERS

*See Machines, Flanging*

## FLANGES, BLOW PIPE

*See Fittings, Blow Pipe*

## FLASHINGS, ROOF, PATENTED

- Alpha Metal & Rolling Mills, Inc., Brooklyn.
- American Rolling Mill Co., Middletown, Ohio. (Galvanized)
- Barber Asphalt Corporation, Barber, N. J.
- Barrett Division, Allied Chemical & Die Corporation, New York City (for brick and concrete)
- Berger Mfg. Div. Republic Steel Co., Canton, Ohio.
- Biersach & Niedermeyer Co., Milwaukee.
- Byers Flashing Sales Division, Chicago.
- Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
- Cheney Co., Ardmore, Pa.
- Chicago Metal Mfg. Co., Chicago, Ill.
- Copper Roofs Corporation, Milwaukee.
- Cox Roofing Co., Winston-Salem, N. C.
- Downs-Smith Brass & Copper Co., New York City.
- Eagle-Picher Lead Co., Cincinnati, O.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Figge Mfg. Co., Chicago, Ill.
- Flemm Lead Company, Inc., Long Island City, N. Y.
- Hussey & Co., C. G., Pittsburgh, Pa.
- Majestic Flashing Company, Baltimore.
- Martin Metal Mfg. Co., Wichita, Kan.
- Milcor Steel Co., Milwaukee, Wis.
- New Delphos Manufacturing Co., Delphos, Ohio.
- Revere Copper and Brass Incorporated, New York City.
- Robertson Co., H. H., Pittsburgh, Pa.
- Rochester Lead Works, Inc., Rochester, N. Y.
- Schoedinger, F. O., Columbus, O.
- Simplex Manufacturing Co., Fond du Lac, Wis.
- Van Noorden Co., E., Boston, Mass.
- Williams-Wallace Co., San Francisco.
- York Corrugating Co., York, Pa.

## FLASHINGS, THROUGH-WALL, PATENTED

- Alpha Metal & Rolling Mills, Inc., Brooklyn.
- American Brass Co., Waterbury, Conn. (Copper)
- Barber Asphalt Corporation, Barber, N. J.
- Biersach & Niedermeyer Company, Milwaukee.
- Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
- Cheney Co., Ardmore, Pa. (copper)
- Downs-Smith Brass & Copper Co., Inc., New York City.
- Figge Mfg. Co., Chicago.
- Majestic Flashing Company, Baltimore.
- New Delphos Manufacturing Co., Delphos, Ohio.
- Revere Copper and Brass Incorporated, New York City.
- Robertson Co., H. H., Pittsburgh, Pa.
- ThruBond Flashing Corp., New York City.
- Van Noorden Co., E., Boston.

## FLASHINGS, WALL, PATENTED

- Alpha Metal & Rolling Mills, Inc., Brooklyn.
- Barber Asphalt Corporation, Barber, N. J.
- Biersach & Niedermeyer Company, Milwaukee.
- Cheney Co., Ardmore, Pa.
- Copper Roofs Corporation, Milwaukee.
- Figge Mfg. Co., Chicago.
- La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
- Majestic Flashing Company, Baltimore.
- Milcor Steel Co., Milwaukee, Wis.
- Revere Copper and Brass Incorporated, New York City.
- Schoedinger, F. O. Co., Columbus, O.
- ThruBond Flashing Corp., New York City.
- Van Noorden Co., E., Boston.
- York Corrugating Co., York, Pa.

## FLOOR FURNACES

*See Furnaces, Warm Air, Floor*

## FLUE GAS ANALYZERS

*See Analyzers, CO<sub>2</sub>, Portable*

## FLUX, SOLDERING

- Air Reduction Sales Company, New York City. (Aluminum)
- Allen Co., L. B., Chicago (Aluminum, Copper, Galv. Iron, Stainless Steel)
- American Chemical Paint Co., Ambler, Pa.
- American Solder & Flux Co., Philadelphia, Pa.
- Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
- Benson Co., Inc., Alex R., Hudson, N. Y. (Salts, Pastes)
- Burnley Battery & Mfg. Co., North East, Pa. (Paste, Salts, Solution) (Copper, Galvanized Iron)
- Chase Brass & Copper Co., Incorporated, Waterbury, Conn. (Copper sweat fittings)
- Colonial Alloys Company, Philadelphia. (Stainless)
- Diener Mfg. Co., Geo. W., Chicago, Ill.
- du Pont de Nemours & Co., E. I., Wilmington, Del. (Copper, Galvanized Iron)
- Gardiner Metal Co., Chicago, Ill.
- Handy & Harman, New York City. (Copper, galvanized iron, stainless).
- Hercules Chemical Co., Inc., New York City.

Imperial Brass Mfg. Co., Chicago, Ill.

Johnson Co., Lloyd S., Chicago. (Aluminum, stainless steel, copper, galvanized iron)

● Johnson Gas Appliance Co., Cedar Rapids, Iowa.

Kester Solder Co., Chicago, Ill.

Langsenkamp Co. F. H., Indianapolis, Ind. (Stainless Steel)

Linde Air Products Co., New York City. (Aluminum, copper, galv. iron, stainless)

Lukens Metal Co., Thos. F., Philadelphia, Pa. (Copper, Galvanized Iron, Stainless Steel)

McNamee Products, Glencoe, Ill.

Motex Metal Process Corporation, Detroit.

Pfanstiehl Chemical Co., Waukegan, Ill.

Potomac Mfg. Co., Philadelphia, Pa.

● Reiner & Campbell Co., Inc., Elizabeth, N. J.

● Ruby Chemical Co., Columbus, O. (Liquid and Paste for copper, galv. iron, stainless).

Torchwelt Equipment Div. National Cylinder Gas Co., Chicago, Ill. (Aluminum, copper, galv. iron, stainless)

Woodhill Chemical Co., Cleveland.

## FRAMING, FOR HOUSING ASSEMBLIES

Dry-Zero Corporation, Chicago.

## FUEL UNITS FOR OIL BURNERS

*See Units, Fuel, for Oil Burners*

## FURNACE BLOWERS

*See Blowers, Furnace, Centrifugal*

## FURNACE-BURNER UNITS

*See Furnaces, Warm Air*

## FURNACE CEMENT

*See Cement, Furnace*

## FURNACE CLEANERS

*See Cleaners, Vacuum, Furnace*

## FURNACE COVERING

*See Insulation, Furnace and Pipe*

## FURNACE LIGHTERS

*See Lighters, Furnace*

## FURNACE LINING

*See Refractories*

## FURNACE PIPE

*See Pipe, Furnace*

## FURNACE PIPE FITTINGS AND ACCESSORIES

*See Fittings and Accessories, Furnace Pipe*

## FURNACE REGULATORS

*See Regulators, Furnace Draft, Mechanical and Motors, Damper, Furnace Draft, Electrical*

## FURNACE REPAIRS

*See Repairs, Stove and Furnace*

## FURNACES, SOLDERING

- Aeroll Burner Co., Inc., West New York, N. J.
- Bernz Co., Inc., Otto, Rochester, N. Y.
- Burgess Soldering Furnace Co., Columbus, O. (Gasoline)
- Clayton & Lambert Mfg. Co., Detroit, Mich.
- Diener Mfg. Co., Geo. W., Chicago, Ill.
- Electric Soldering Iron Co., Inc., Deep River, Conn.
- Floral City Company, Monroe, Mich.
- Hones, Inc., Charles A., Baldwin, N. Y.
- Insto-Gas Corporation, Detroit.
- Johnson Gas Appliance Co., Cedar Rapids, Ia.
- Lenk Mfg. Company, Newton Lower Falls, Mass.
- Liquefied Gas Appliance Co., Mars, Pa.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Reiner & Campbell Co., Inc., Elizabeth, N. J.
- Reliable Gas Products Co., Cedar Rapids, Ia.
- Turner Brass Works, Sycamore, Ill.
- Van Praag Sales, New York City.
- Vulcan Electric Co., Danvers, Mass.
- Wall Mfg. Supply Co., P., N. S. Pittsburgh.
- Ward Machinery Co., Chicago. (Gas)
- Weiss & Co., H., New York City.

## FURNACES, WARM AIR, AIR CONDITIONING, COAL, CAST IRON

*(Complete matched, hand-fired, furnace, fan, filter and humidifier unit)*

- Adelta Manufacturing Co., Philadelphia.
- Agricola Furnace Co., Inc., Gadsden, Ala.
- Airtemp Div. Chrysler Corp., Dayton, Ohio.
- American Foundry & Furnace Co., Bloomington, Ill.
- American Furnace & Foundry Co., Milan, Mich.
- American Radiator and Standard Sanitary Corp., Pittsburgh.

Andes Range & Furnace Corp. Geneva, N. Y.  
 Bovee Furnace Works, Waterloo, Ia.  
 ● Chandler Co., Cedar Rapids, Ia.  
 Cleveland Steel Products Corp., Cleveland.  
 Excelsior Steel Furnace Co., Chicago, Ill.  
 Farris Furnace Company, Springfield, Ill.  
 Faultless Heater Corp., Cleveland, O.  
 ● Forest City Foundries Co., Cleveland, O.  
 ● Front Rank Furnace Company, Div. Liberty Foundry Co., St. Louis, Mo.  
 Green Colonial Furnace Co., Des Moines, Ia.  
 ● Hall-Neal Furnace Co., Indianapolis, Ind.  
 Hart & Crouse Corp., Utica, N. Y.  
 ● Henry Furnace & Fdy. Co., Cleveland, O.  
 Hess-Snyder Co., Massillon, O.  
 Home Furnace Co., Holland, Mich.  
 ● Homer Furnace & Foundry Corp., Coldwater, Mich.  
 Ideal Furnace Co., Detroit, Mich.  
 Independence Stove & Furnace Co., Independence, Mo.  
 International Heater Co., Utica, N. Y.  
 Keith Furnace Co., Des Moines, Ia.  
 Kelsey Heating Co., Inc., Syracuse, N. Y.  
 MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.  
 Majestic Co., Huntington, Ind.  
 Marshall Furnace Co., Marshall, Mich.  
 ● May-Fiebeger Co., Newark, O.  
 ● Meyer Furnace Co., Peoria, Ill.  
 ModernAire Co. Div. Des Moines Stove Repair Co., Des Moines, Ia.  
 Montag Stove & Furnace Works, Portland, Ore.  
 Mount Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.  
 ● Mueller Furnace Co., L. J., Milwaukee, Wis.  
 ● Olsen Mfg. Co., C. A., Elyria, O.  
 Pittsburgh Furnace Parts Co., Pittsburgh, Pa.  
 Portland Stove Foundry Co., Portland, Me.  
 ● Premier Furnace Co., Dowagiac, Mich.  
 Reynolds Manufacturing Co., Springfield, Ohio.  
 Robinson Furnace Co., Chicago, Ill.  
 Rock Island Stove Co., Rock Island, Ill.  
 ● Round Oak Co., Dowagiac, Mich.  
 Rudy Furnace Co., Dowagiac, Mich.  
 ● Rybolt Heater Co., Ashland, O.  
 ● St. Louis Furnace Manufacturing Co., St. Louis, Mo.  
 Schwab Furnace Co., Milwaukee, Wis.  
 Schill Mfg. Co., Crestline, O.  
 Sioux City Foundry & Boiler Company, Sioux City, Ia.  
 Spear Stove & Heater Co., James, Philadelphia.  
 Twentieth Century Heating & Ventilating Co., Akron, O.  
 Western Furnaces, Inc., Tacoma, Wash.  
 ● Williamson Heater Co., Cincinnati, O.  
 ● Wise Furnace Co., Akron, O.  
 XXth Century Heating & Ventilating Co., Akron, O.  
 York Ice Machinery Corporation, York, Pa.

### FURNACES, WARM AIR, AIR CONDITIONING, COAL, STEEL

(Complete matched, hand-fired, furnace, fan, filter and humidifier unit)

Adelta Manufacturing Co., Philadelphia.  
 Airtemp Div., Chrysler Corp., Dayton, Ohio.  
 American Foundry & Furnace Co., Bloomington, Ill.  
 American Furnace Co., St. Louis.  
 American Furnace & Foundry Co., Milan, Mich.  
 ● American Radiator and Standard Sanitary Corp., Pittsburgh.  
 American Welding & Engineering Corp., Milwaukee, Wis.  
 Andrews Heating Co., Minneapolis.  
 Arcweld Manufacturing Co., Inc., Seattle, Wash.  
 Armstrong Furnace Co., Columbus, O.  
 Beck Engineering Combustion Kompany, St. Louis.  
 Bovee Furnace Works, Waterloo, Ia.  
 Campbell Heating Co., Des Moines, Ia.  
 Campbell Heating Co., E. K., Kansas City, Mo.  
 ● Chandler Co., Cedar Rapids, Ia.  
 Cleveland Steel Products Corp., Cleveland.  
 Deshler Foundry & Machine Works, Deshler, Ohio.  
 ● Dowagiac Steel Furnace Company, Dowagiac, Mich.  
 Excelsior Steel Furnace Co., Chicago, Ill.  
 Farquhar Furnace Co., Wilmington, O.  
 Faultless Heater Corp., Cleveland.  
 ● Fitzgibbons Boiler Company, Inc., New York City.  
 ● Forest City Foundries Co., Cleveland, O.  
 ● Front Rank Furnace Company, Div. Liberty Foundry Co., St. Louis.  
 Green Colonial Furnace Co., Des Moines, Ia.  
 Grossenbacher Furnace Co., St. Louis, Mo.  
 ● Hall-Neal Furnace Co., Indianapolis, Ind.  
 Heatlox Furnaces, Inc., Tacoma, Wash.  
 ● Henry Furnace & Fdy. Co., Cleveland, O.  
 Hess-Snyder Co., Massillon, O.  
 ● Hess Warming & Ventilating Co., Chicago, Ill.  
 ● Homer Furnace & Foundry Corp., Coldwater, Mich.  
 Ideal Furnace Co., Detroit, Mich.  
 Ingersoll Steel & Disc. Div., Borg-Warner Corp., Chicago.  
 International Heater Co., Utica, N. Y.  
 Joliet Heating Corp., Joliet, Ill.  
 Keith Furnace Co., Des Moines, Ia.  
 Kelsey Heating Co., Inc., Syracuse, N. Y.  
 Koons Furnace Co., Danville, Ill.  
 ● Leader Iron Works, Decatur, Ill.

Lee Furnace Co., South Bend, Ind.  
 Lennox Furnace Co., Marshalltown, Ia.  
 McLouth Air Conditioning Corp., Lansing, Mich.  
 McPherson Furnace & Supply Co., Portland, Ore. (Also sawdust and wood burning)  
 Majestic Co., Huntington, Ind.  
 Marshall Furnace Co., Marshall, Mich.  
 ● May-Fiebeger Co., Newark, O.  
 ● Meyer Furnace Co., Peoria, Ill.  
 ● Michigan Tank & Furnace Corp., Detroit, Mich.  
 ModernAire Co., Div. Des Moines Stove Repair Co., Des Moines, Ia.  
 Montag Stove & Furnace Works, Portland, Ore.  
 ● Mueller Furnace Co., L. J., Milwaukee, Wis.  
 National Manufacturing & Engineering Co., Detroit, Mich.  
 Northwest Stove & Furnace Works, Portland, Ore.  
 ● Olsen Mfg. Co., C. A., Elyria, O.  
 Parker Heating & Manufacturing Co., St. Petersburg, Fla.  
 Pennsylvania Furnace & Iron Co., Warren, Pa.  
 Pittsburgh Furnace Parts Co., Pittsburgh, Pa.  
 Portland Stove Foundry Co., Portland, Me.  
 Robinson Furnace Co., Chicago.  
 Rosebraugh Co., W. W., Salem, Ore.  
 ● Round Oak Co., Dowagiac, Mich.  
 Rudy Furnace Co., Dowagiac, Mich.  
 ● Rybolt Heater Co., Ashland, O.  
 ● St. Louis Furnace Manufacturing Co., St. Louis, Mo.  
 Sandberg Co., H. J., Portland, Ore.  
 Schill Mfg. Co., Crestline, O.  
 Schwab Furnace Co., Milwaukee, Wis.  
 Skinner Heating & Vent. Co., Heater Div. of St. Louis  
 Blow Pipe & Heater Co., Inc., St. Louis.  
 Spencer Heater Division, Williamsport, Pa.  
 Standard Furnace & Supply Co., Omaha, Nebr.  
 Sure Comfort Furnace Co., Berwyn, Ill.  
 ● Waterman-Waterbury Co., Minneapolis, Minn.  
 Westinghouse Electric & Mfg. Co., Springfield, Mass.  
 ● Williamson Heater Co., Cincinnati, O.  
 ● Wise Furnace Co., Akron, O.  
 York Ice Machinery Corporation, York, Pa.

### FURNACES, WARM AIR, AIR CONDITIONING, FOR ATTIC INSTALLATION, STEEL

American Furnace Co., St. Louis. (Oil or Gas)  
 Gasconaire, Inc., Detroit (Gas)  
 Lennox Furnace Co., Marshalltown, Iowa.  
 ● Payne Furnace & Supply Co., Beverly Hills, Cal. (Gas)  
 Stephens Mfg. Co., Tulsa, Okla.  
 York Ice Machinery Corporation, York, Pa.

### FURNACES, WARM AIR, AIR CONDITIONING, GAS, CAST IRON

(Complete matched, gas-fired, furnace, fan, filter and humidifier unit)

Adelta Manufacturing Co., Philadelphia.  
 Airtemp Division, Chrysler Corporation, Dayton, O.  
 American Foundry & Furnace Co., Bloomington, Ill.  
 American Furnace Company, St. Louis.  
 ● American Radiator and Standard Sanitary Corp., Pittsburgh.  
 Bastain-Morley Co., Inc., LaPorte, Ind.  
 Beck Engineering Combustion Kompany, St. Louis.  
 Bryant Heater Co., Cleveland.  
 Burke Stoker & Mfg. Co., Chicago.  
 Cleveland Steel Products Corp., Cleveland.  
 ● Forest City Foundries Co., Cleveland, O.  
 Green Colonial Furnace Co., Des Moines, Ia.  
 ● Henry Furnace & Fdy. Co., Cleveland, O.  
 Hess-Snyder Co., Massillon, O.  
 Ideal Furnace Co., Detroit, Mich.  
 International Heater Co., Utica, N. Y.  
 Moncrief Furnace & Mfg. Co., Dallas, Tex.  
 ● Mueller Furnace Co., L. J., Milwaukee, Wis.  
 ● Pacific Gas Radiator Co., Huntington Park, Cal.  
 Pennsylvania Furnace & Iron Co., Warren, Pa.  
 ● Premier Furnace Co., Dowagiac, Mich.  
 Richmond Radiator Co., Inc., Uniontown, Pa.  
 Rudy Furnace Co., Dowagiac, Mich.  
 ● Rybolt Heater Co., Ashland, O.  
 Schwab Furnace Co., Milwaukee, Wis.  
 Security Manufacturing Co., Kansas City, Mo.  
 Sioux City Foundry and Boiler Company, Sioux City, Ia.  
 ● Surface Combustion Corp., Toledo, O.  
 Thatcher Furnace Co., Newark, N. J.  
 Twentieth Century Heating & Ventilating Co., Akron, O.  
 Vacuum Gas Appliance Div., Union Fork & Hoe Co., Rome, N. Y.  
 Viking Mfg. Corp., Dayton, Ohio.  
 XXth Century Heating & Ventilating Co., Akron, O.  
 ● Wise Furnace Co., Akron, O.  
 York Ice Machinery Corp., York, Pa.

### FURNACES, WARM AIR, AIR CONDITIONING, GAS, STEEL

(Complete matched, gas-fired, furnace, fan, filter and humidifier unit)

Adelta Manufacturing Co., Philadelphia.  
 Airtemp Div., Chrysler Corp., Dayton, Ohio.

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Aladdin Heating Corporation, Oakland, Cal.  
 Allied Heating & Air Conditioning Co., Lawndale, Cal.  
 American Furnace Company, St. Louis.  
 ● American Radiator and Standard Sanitary Corp., Pittsburgh.  
 American Standard Gas Products Co., Detroit.  
 Andrews Heating Company, Minneapolis.  
 Armstrong Furnace Co., Columbus, O.  
 Auburn Burner Co., Auburn, Ind.  
 ● Bard Mfg. Co., Bryan, O.  
 Beck Engineering Combustion Kompany, St. Louis.  
 Bryant Corp., C. L., Cleveland, O.  
 Burke Stoker & Mfg. Co., Chicago.  
 Campbell Heating Company, Des Moines, Ia.  
 Campbell Heating Co., E. K., Kansas City, Mo.  
 Carrier Corp., Syracuse, N. Y.  
 ● Chandler Company, Cedar Rapids, Ia.  
 ● Conco Corporation, Mendota, Ill.  
 Coroaire Heating Corporation, Cleveland.  
 Dalzen Manufacturing Co., Detroit.  
 Delco Appliance Div., General Motors Sales Corp., Rochester, N. Y.  
 Dornback Furnace & Foundry Co., Cleveland.  
 ● Dowagiac Steel Furnace Co., Dowagiac, Mich.  
 Dunham Co., C. A., Chicago.  
 Electrogas Furnace Co., San Francisco, Cal.  
 Essick Manufacturing Co., Los Angeles.  
 ● Fitzgibbons Boiler Co., Inc., New York City.  
 Floral City Company, Monroe, Mich.  
 ● Forest City Foundries Co., Cleveland, O.  
 Fraser and Johnston Co., San Francisco.  
 Gasconaire, Inc., Detroit, Mich.  
 Gaul Air Conditioner Co., Dayton, Ohio.  
 ● General Electric Company, Bloomfield, N. J.  
 General Gas Light Co., Kalamazoo, Mich.  
 ● Gillen Company, J. L., Dowagiac, Mich.  
 Glasby Manufacturing Co., Inc., J. P., Bloomfield, N. J.  
 Green Colonial Furnace Co., Des Moines, Ia.  
 Grossenbacher Furnace Co., St. Louis, Mo.  
 ● Hall-Neal Furnace Co., Indianapolis, Ind.  
 Heating Equipment Co., San Francisco.  
 Heatlox Furnaces, Inc., Tacoma, Wash.  
 Hell Co., The, Milwaukee.  
 ● Hess Warming & Ventilating Co., Chicago, Ill.  
 Holly Heating & Mfg. Co., So. Pasadena, Cal.  
 Huwer Heating Corp., Detroit.  
 Ideal Furnace Co., Detroit, Mich.  
 Independence Stove & Furnace Co., Independence, Mo.  
 Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.  
 Johnston Gas Furnace Corp., North Hollywood, Cal.  
 Joliet Heating Corp., Joliet, Ill.  
 Kaustine Co., Inc., Perry, N. Y.  
 Keith Furnace Co., Des Moines, Ia.  
 Kent Co., Inc., J. King, St. Louis.  
 Koons Furnace Company, Danville, Ill.  
 Leeson Air Conditioning Corporation, Detroit.  
 Lennox Furnace Co., Marshalltown, Ia.  
 McLouth Air Conditioning Corp., Lansing, Mich.  
 Majestic Co., Huntington, Ind.  
 Marlon Furnace Co., Detroit.  
 ● May-Flebeiger Co., Newark, O.  
 ● Mayflower Air-Conditioners, Inc., St. Paul.  
 ● Meyer Furnace Co., Peoria, Ill.  
 ● Michigan Tank & Furnace Corp., Detroit, Mich.  
 Moncrief Furnace & Mfg. Co., Inc., Dallas, Texas.  
 ● Morrison Steel Products, Inc., Buffalo, N. Y.  
 ● Mueller Furnace Co., L. J., Milwaukee, Wis.  
 National Manufacturing & Eng. Co., Detroit, Mich.  
 New Mission Htg. & Vent. Co., San Francisco, Cal.  
 Northern Furnace & Supply Co., Billings, Mont.  
 Ohio Foundry & Mfg. Co., Steubenville, O.  
 ● Olsen Mfg. Co., C. A., Elyria, O.  
 Pacific Gas Heating Co., San Francisco.  
 ● Pacific Gas Radiator Co., Huntington Park, Cal.  
 Palmer Manufacturing Corp., Phoenix, Ariz.  
 Parker Heating & Mfg. Co., St. Petersburg, Fla.  
 ● Patten Co., J. V., Sycamore, Ill.  
 ● Payne Furnace & Supply Co., Beverly Hills, Cal.  
 Pennsylvania Furnace & Iron Co., Warren, Pa.  
 Perfection Stove Co., Cleveland, O.  
 Pernot & Rich, Inc., Los Angeles, Cal.  
 ● Premier Furnace Company, Dowagiac, Mich.  
 Relf-Rexoil, Inc., Buffalo, N. Y.  
 Reznor Mfg. Co., Mercer, Pa.  
 Robinson Furnace Co., Chicago.  
 ● Round Oak Co., Dowagiac, Mich.  
 ● Royal Air Conditioning Equipment, Alhambra, Cal.  
 Rudy Furnace Co., Dowagiac, Mich.  
 ● Rybolt Heater Co., Ashland, O.  
 Ryniker Sheet Metal Works, Inc., Billings, Mont.  
 ● St. Louis Furnace Manufacturing Co., St. Louis, Mo.  
 Schill Mfg. Co., Crestline, O.  
 Schwab Furnace Co., Milwaukee, Wis.  
 Scott-Newcomb, Inc., St. Louis, Mo.  
 Season-Aire Corporation of America, Detroit.  
 Security Manufacturing Co., Kansas City, Mo.  
 Standard Furnace & Supply Co., Omaha, Nebr.  
 Stephens Mfg. Co., Tulsa, Okla.  
 Twentieth Century Heating & Ventilating Co., Akron, O.  
 United States Radiator Corp., Detroit, Mich.  
 ● Utility Fan Corporation, Los Angeles, Cal. (Butane)

Viking Mfg. Corp., Dayton, Ohio.

- Waterman-Waterbury Co., Minneapolis, Minn.
- Wayne Oil Burner Corporation, Fort Wayne, Ind.
- Westinghouse Electric & Mfg. Co., Springfield, Mass.
- Wheeling Furnace Corporation, Martins Ferry, Ohio.
- Wise Furnace Co., Akron, O.
- Williamson Heater Co., Cincinnati, O.
- Wood Industries, Inc., Gar, Detroit.
- XXth Century Heating & Ventilating Co., Akron, O.

## FURNACES, WARM AIR, AIR CONDITIONING, OIL, CAST IRON

(Complete matched, oil-burning furnace, fan, filter and humidifier unit)

- Adelta Manufacturing Co., Philadelphia, Pa.
- American Foundry & Furnace Co., Bloomington, Ill.
- American Radiator & Standard Sanitary Corp., Pittsburgh.
- Arcweld Manufacturing Co., Inc., Seattle, Wash.
- Auto-Heat Corporation, New York City.
- Chandler Co., Cedar Rapids, Ia.
- Excelsior Steel Furnace Co., Chicago.
- Hess-Snyder Co., Massillon, Ohio.
- Home Furnace Co., Holland, Mich.
- International Heater Co., Utica, N. Y.
- Keith Furnace Co., Des Moines, Ia.
- Kelsey Heating Co., Inc., Syracuse, N. Y.
- MaGirl Foundry and Furnace Works, P. H., Bloomington, Ill.
- Montag Stove & Furnace Works, Portland, Ore.
- Mount Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
- Mueller Furnace Co., L. J., Milwaukee.
- Portland Stove Foundry Co., Portland, Me.
- Premier Furnace Co., Dowagiac, Mich.
- R-S Products Corporation, Philadelphia.
- Rudy Furnace Co., Dowagiac, Mich.
- Rybolt Heater Co., Ashland, Ohio.
- St. Louis Furnace Manufacturing Co., St. Louis, Mo.
- Sandberg Co., H. J., Portland, Ore.
- Schwab Furnace Co., Milwaukee, Wis.
- Sloux City Foundry & Boiler Co., Sloux City, Ia.
- Standard Furnace & Supply Co., Omaha, Nebr.
- Westwick & Son, Inc., John, Galena, Ill.
- Wise Furnace Company, Akron, Ohio.

## FURNACES, WARM AIR, AIR CONDITIONING, OIL, STEEL

(Complete matched, oil-burning furnace, fan, filter and humidifier unit)

- Adelta Manufacturing Co., Philadelphia.
- AireOzone Corporation, Chicago.
- Airtemp Division Chrysler Corp., Dayton, Ohio.
- American Air Conditioning Corp., Sebastopol, Cal.
- American Furnace Co., St. Louis.
- American Furnace & Foundry Co., Milan, Mich.
- American Radiator and Standard Sanitary Corp., Pittsburgh.
- American Stove Co., Lorain, O.
- American Welding & Engineering Corp., Milwaukee.
- Andrews Heating Company, Minneapolis.
- Arcweld Manufacturing Co., Inc., Seattle, Wash.
- Armstrong Furnace Co., Columbus, Ohio.
- Atlas Heating & Ventilating Co., Ltd., San Francisco.
- Auburn Burner Co., Auburn, Ind.
- Auburn Foundry, Inc., Stoker Div., Auburn, Ind.
- Auto-Heat Corporation, New York City.
- Automatic Burner Corporation, Chicago.
- Baker Furnace & Cleaner Mfg. Co., Toledo, Ohio.
- Bard Mfg. Co., Bryan, Ohio.
- Beck Engineering Combustion Kompany, St. Louis.
- Bethlehem Foundry & Machine Co., Bethlehem, Pa.
- Bovee Furnace Works, Waterloo, Ia.
- Bryant Corp., C. L., Cleveland.
- Campbell Heating Co., Des Moines, Ia.
- Campbell Heating Co., E. K., Kansas City, Mo.
- Carrier Corp., Syracuse, N. Y.
- Cary Manufacturing Co., Waupaca, Wis.
- Century Engineering Corporation, Cedar Rapids, Iowa.
- Chandler Co., Cedar Rapids, Ia.
- Cleveland Steel Products Corp., Toridheet Div., Cleveland.
- Conco Corporation, Mendota, Ill.
- Coroaire Heating Corp., Cleveland.
- Dalzen Manufacturing Co., Detroit.
- Delco Appliance Div., General Motors Sales Corp., Rochester, N. Y.
- Deshler Foundry & Machine Works, Deshler, Ohio.
- Dowagiac Steel Furnace Company, Dowagiac, Mich.
- Duo-Therm Division, Motor Wheel Corporation, Lansing, Mich.
- Eastern Oil & Equipment Co., Portland, Me.
- Electrol Incorporated, Clifton, N. J.
- Evans Corp., George, Moline, Ill.
- Excelsior Steel Furnace Co., Chicago.
- Farquhar Furnace Co., Wilmington, O.
- Fitzgibbons Boiler Co., Inc., New York City.
- Floral City Company, Monroe, Mich.
- Fluid Heat Div., Anchor Post Fence Co., Baltimore.
- Forest City Foundries Co., Cleveland, O.
- Front Rank Furnace Div., Liberty Foundry Co., St. Louis.
- Gasoroll Mfg. Corp., Genoa City, Wis.
- Gehri Co., Tacoma, Wash.

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- General Electric Co., Bloomfield, N. J.
- Gilbert & Barker Mfg. Co., Springfield, Mass.
- Gillen Company, J. L., Dowagiac, Mich.
- Glasby Manufacturing Co., Inc., J. P., Bloomfield, N. J.
- Green Colonial Furnace Co., Des Moines, Ia.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Harvey-Whipple, Inc., Springfield, Mass.
- Heatlox Furnaces, Inc., Tacoma, Wash.
- Heil Co., Milwaukee.
- Henry Furnace & Fdy. Co., Cleveland.
- Hess-Snyder Co., Massillon, Ohio.
- Hess Warming & Ventilating Co., Chicago.
- Hipoint Corp., Bellefontaine, O.
- Hoffman Specialty Co., Inc., Indianapolis, Ind.
- Homer Furnace & Foundry Corp., Coldwater, Mich.
- Hotentot Co., Inc., Omaha, Nebr.
- Huwer Heating Corp., Detroit.
- Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
- International Heater Company, Utica, N. Y.
- Interstate Metal Products Co., Inc., Chicago.
- Joliet Heating Corp., Joliet, Ill.
- Johnson Co., S. T., Oakland, Cal., and Philadelphia.
- Kaustine Co., Inc., Perry, N. Y.
- Keith Furnace Co., Des Moines, Ia.
- Kelsey Heating Co., Inc., Syracuse, N. Y.
- Kleen-Heat, Inc., Chicago.
- Knowles Air Conditioning, Minneapolis.
- Koons Furnace Company, Danville, Ill.
- Kruse Company, Indianapolis, Ind.
- Laco Oil Burner Co., Griswold, Ia.
- Lee Furnace Co., South Bend, Ind.
- Lennox Furnace Co., Marshalltown, Ia.
- Little Burner Co., Inc., H. C., San Rafael, Cal.
- Lochinvar Products Div., Michigan Tank & Furnace Corp., Dearborn, Mich.
- McLouth Air Conditioning Corp., Lansing, Mich.
- McPherson Furnace & Supply Co., Portland, Ore.
- Majestic Company, Huntington, Ind.
- Marlon Furnace Co., Detroit.
- May-Fiebeger Co., Newark, Ohio.
- May Oil Burner Corp., Baltimore, Md.
- Mayflower Air-Conditioners, Inc., St. Paul.
- Meyer Furnace Co., Peoria, Ill.
- Michigan Tank & Furnace Corp., Detroit.
- ModernAire Co. Div. Des Moines Stove Repair Co., Des Moines, Ia.
- Montag Stove & Furnace Works, Portland, Ore.
- Morrison Steel Products, Inc., Buffalo, N. Y.
- Mueller Furnace Co., L. J., Milwaukee.
- National Manufacturing & Eng. Co., Detroit.
- Nelson Company, Detroit.
- Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit.
- Northwest Stove & Furnace Works, Portland, Ore.
- Nu-Way Corp., Rock Island, Ill.
- Olsen Mfg. Co., C. A., Elyria, O.
- Pacific Gas Heating Co., San Francisco.
- Parker Heating & Manufacturing Co., St. Petersburg, Fla.
- Patten Co., J. V., Sycamore, Ill.
- Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
- Perfection Stove Co., Cleveland.
- Petroleum Heat & Power Co., Stamford, Conn.
- Progressive Company, Chicago.
- Quaker Mfg. Co., Chicago.
- Quincy Stove Manufacturing Co., Quincy, Ill.
- R-S Products Corp., Philadelphia.
- Radiation Furnace Corp., Benton Harbor, Mich.
- Ray Oil Burner Co., San Francisco.
- Reif-Rexoll, Inc., Buffalo, N. Y.
- Robinson Furnace Co., Chicago.
- Rosebraugh Co., W. W., Salem, Ore.
- Round Oak Co., Dowagiac, Mich.
- Rudy Furnace Co., Dowagiac, Mich.
- Rybolt Heater Company, Ashland, Ohio.
- St. Louis Furnace Manufacturing Co., St. Louis, Mo.
- Sandberg Co., H. J., Portland, Ore.
- Schwab Furnace Co., Milwaukee, Wis.
- Schwitzer-Cummins Co., Indianapolis, Ind.
- Scott-Newcomb, Inc., St. Louis.
- Season-Aire Corporation of America, Detroit.
- Silent Sioux Oil Burner Corp., Orange City, Ia.
- Skinner Htg. & Vent. Co., Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
- Standard Furnace & Supply Co., Omaha, Nebr.
- Sundstrand Engineering Company, Rockford, Ill.
- Sure Comfort Furnace Co., Berwyn, Ill.
- Syncro-Flame Burner Corp., Willimantic, Conn.
- Synchronatic Air Conditioning Corporation, Milwaukee.
- Timken Silent Automatic Div., Timken-Detroit Axle Co., Detroit.
- United States Radiator Corp., Detroit.
- Viking Mfg. Corp., Dayton, Ohio.
- Waterman-Waterbury Co., Minneapolis.
- Wayne Oil Burner Corporation, Fort Wayne, Ind.
- Weatherall Engineers, Inc., Providence, R. I.
- Western Blower Company, Seattle, Wash.
- Westinghouse Electric & Mfg. Co., Springfield, Mass.
- Westwick & Son, Inc., John, Galena, Ill.
- Wheeling Furnace Corporation, Martins Ferry, Ohio.
- Williamson Heater Co., Cincinnati.
- Wood Industries, Inc., Gar, Detroit.

York Ice Machinery Corp., York, Pa.  
York Oil Burner Company, Inc., York, Pa.

## FURNACES, WARM AIR, AIR CONDITIONING, STOKER, CAST IRON

(Complete matched, stoker-furnace, fan, filter, and humidifier unit)

- Adelta Manufacturing Co., Philadelphia.
- American Foundry & Furnace Co., Bloomington, Ill.
- American Furnace & Foundry Co., Milan, Mich.
- American Radiator and Standard Sanitary Corp., Pittsburgh.
- Auburn Foundry, Inc., Stoker Div., Auburn, Ind.
- Bovee Furnace Works, Waterloo, Ia.
- Chandler Co., Cedar Rapids, Iowa.
- Cleveland Steel Products Corp., Toridheat Div., Cleveland.
- Forest City Foundries Co., Cleveland, O.
- Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
- Grossenbacher Furnace Co., Inc., St. Louis.
- Hess-Snyder Co., Massillon, O.
- Homer Furnace & Fdry. Corp., Coldwater, Mich.
- International Heater Co., Utica, N. Y.
- Keith Furnace Co., Des Moines, Ia.
- MaGill Foundry and Furnace Works, P. H., Bloomington, Ill.
- Montag Stove & Furnace Works, Portland, Ore.
- Mount Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
- Mueller Furnace Co., L. J., Milwaukee.
- Schwab Furnace Co., Milwaukee, Wis.
- St. Louis Furnace Manufacturing Co., St. Louis, Mo.
- Sioux City Foundry & Boiler Co., Sioux City, Ia.
- Williamson Heater Co., Cincinnati.
- York Ice Machinery Corporation, York, Pa.

## FURNACES, WARM AIR, AIR CONDITIONING, STOKER, STEEL

(Complete matched, stoker-furnace, fan, filter, and humidifier unit)

- Allis-Chalmers Mfg. Co., Milwaukee.
- American Furnace Co., St. Louis.
- American Furnace & Foundry Co., Milan, Mich.
- American Radiator and Standard Sanitary Corp., Pittsburgh.
- American Welding & Engineering Corp., Milwaukee.
- Anchor Stove & Range Co., New Albany, Ind.
- Andrews Heating Co., Minneapolis.
- Arcweld Manufacturing Co., Inc., Seattle, Wash.
- Armstrong Furnace Co., Columbus, Ohio.
- Auburn Burner Co., Auburn, Ind.
- Baker Furnace & Cleaner Mfg. Co., Toledo, Ohio.
- Bard Mfg. Co., Bryan, Ohio.
- Beck Engineering Combustion Company, St. Louis.
- Bovee Furnace Works, Waterloo, Ia.
- Campbell Heating Co., Des Moines, Ia.
- Campbell Heating Co., E. K., Kansas City, Mo.
- Chandler Co., Cedar Rapids, Ia.
- Cleveland Steel Products Corp., Toridheat Div., Cleveland.
- Conco Corporation, Mendota, Ill.
- Deshler Foundry & Machine Works, Deshler, Ohio.
- Dowagiac Steel Furnace Company, Dowagiac, Mich.
- Farquhar Furnace Company, Wilmington, Ohio.
- Fitzgibbons Boiler Co., Inc., New York City.
- Forest City Foundries Co., Cleveland, O.
- Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
- Grossenbacher Furnace Co., Inc., St. Louis.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Heatlox Furnaces, Inc., Tacoma, Wash.
- Henry Furnace & Fdy. Co., Cleveland.
- Hess-Snyder Co., Massillon, Ohio.
- Hess Warming & Ventilating Co., Chicago.
- Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
- Iron Fireman Manufacturing Co., Cleveland.
- Joliet Heating Corp., Joliet, Ill.
- Keith Furnace Co., Des Moines, Ia.
- Kol-Master Corporation, Oregon, Ill.
- Koons Furnace Co., Danville, Ill.
- Lee Furnace Co., South Bend, Ind.
- Lennox Furnace Co., Marshalltown, Ia.
- McLouth Air Conditioning Corp., Lansing, Mich.
- McPherson Furnace & Supply Co., Portland, Ore.
- Majestic Company, Huntington, Ind.
- May-Fiebeger Co., Newark, Ohio.
- Meyer Furnace Co., Peoria, Ill.
- ModernAire Co. Div. Des Moines Stove Repair Co., Des Moines, Ia.
- Montag Stove & Furnace Works, Portland, Ore.
- National Manufacturing & Engineering Co., Detroit.
- Nelson Company, Detroit.
- Northwest Stove & Furnace Works, Portland, Ore.
- Olsen Mfg. Co., C. A., Elyria, O.
- Parker Heating & Manufacturing Co., St. Petersburg, Fla.
- Pocahontas Fuel Company, Incorporated, Stoker Div., Cleveland.
- Premier Furnace Co., Dowagiac, Mich.
- Robinson Furnace Co., Chicago, Ill.
- Rosebraugh Co., W. W., Salem, Ore.
- Round Oak Co., Dowagiac, Mich.
- Rybolt Heater Co., Ashland, Ohio.
- St. Louis Furnace Manufacturing Co., St. Louis, Mo.
- Sandberg Co., H. J., Portland, Ore.
- Schwab Furnace Co., Milwaukee, Wis.
- Schwitzer-Cummins Co., Indianapolis, Ind.

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Skinner Htg. & Vent. Co., Heater Div. of St. Louis Blow  
Pipe & Heater Co., Inc., St. Louis.  
Standard Stoker Corporation, New Albany, Ind.  
Stok-A-Fire Co., Inc., University City, Mo.  
Sure Comfort Furnace Co., Berwyn, Ill.  
●Waterman-Waterbury Co., Minneapolis.  
Westinghouse Electric & Mfg. Co., Springfield, Mass.  
●Williamson Heater Co., Cincinnati, O.  
York Ice Machinery Corporation, York, Pa.

#### FURNACES, WARM AIR, AIR CONDITIONING, UTILITY ROOM, COAL, STEEL

(Complete matched furnace with burner, fan, filter, humidifier)

Airtemp Div., Chrysler Corp., Dayton, Ohio.  
American Furnace Co., St. Louis, Mo.  
●American Radiator & Standard Sanitary Corp., Pittsburgh,  
Pa.  
Armstrong Furnace Company, Columbus, Ohio.  
●Fitzgibbons Boiler Company, Inc., New York City.  
Floral City Company, Monroe, Mich.  
●Hall-Neal Furnace Co., Indianapolis, Ind.  
Joliet Heating Corporation, Joliet, Ill.  
Lee Furnace Co., South Bend, Ind.  
Lennox Furnace Co., Marshalltown, Ia.  
●Michigan Tank & Furnace Corp., Detroit.  
●Olsen Manufacturing Co., C. A., Elyria, Ohio.  
Parker Heating & Mfg. Co., St. Petersburg, Fla.  
Westinghouse Electric & Mfg. Co., Springfield, Mass.  
●Williamson Heater Co., Cincinnati, Ohio. (Cast Iron)

#### FURNACES, WARM AIR, AIR CONDITIONING, UTILITY ROOM, GAS, CAST IRON

(Complete matched furnace with burner, fan, filter, humidifier)

Airtemp Div., Chrysler Corporation, Dayton, Ohio.  
American Foundry and Furnace Company, Bloomington, Ill.  
American Furnace Co., St. Louis, Mo.  
●American Radiator and Standard Sanitary Corp., Pitts-  
burgh.  
Bastian-Morley Co., Inc., LaPorte, Ind.  
Bryant Heater Co., Cleveland.  
Burke Stoker & Mfg. Co., Chicago.  
●Forest City Foundries Co., Cleveland, O.  
●General Electric Co., Air Conditioning & Commercial Re-  
frigeration Dept., Bloomfield, N. J.  
●Hall-Neal Furnace Co., Indianapolis, Ind.  
●Henry Furnace & Foundry Co., Cleveland.  
●Mueller Furnace Company, L. J., Milwaukee.  
Richmond Radiator Company, Inc., Uniontown, Pa.  
Security Manufacturing Co., Kansas City, Mo.  
●Surface Combustion Corporation, Toledo.  
Vacuum Gas Appliance Div., Union Fork & Hoe Co., Rome,  
N. Y.  
Viking Mfg. Corp., Dayton, Ohio.  
York Ice Machinery Corporation, York, Pa.

#### FURNACES, WARM AIR, AIR CONDITIONING, UTILITY ROOM, GAS, STEEL

(Complete matched furnace with burner, fan, filter, humidifier)

Airtemp Div., Chrysler Corporation, Dayton, Ohio.  
Aladdin Heating Corp., Oakland, Cal.  
Allied Heating & Air Conditioning Co., Lawndale, Cal.  
American Furnace Co., St. Louis.  
●American Radiator and Standard Sanitary Corp., Pittsburgh.  
Armstrong Furnace Company, Columbus, Ohio.  
●Bard Manufacturing Company, Bryan, Ohio.  
Burke Stoker & Mfg. Co., Chicago.  
Carrier Corporation, Syracuse, N. Y.  
●Conco Corporation, Mendota, Ill.  
Dalzen Manufacturing Co., Detroit.  
Electrogas Furnace Co., San Francisco.  
Fraser and Johnston Co., San Francisco.  
General Gas Light Co., Kalamazoo, Mich.  
Gibraltar Engineering Co., Los Angeles.  
Green Colonial Furnace Co., Des Moines, Ia.  
●Hall-Neal Furnace Co., Indianapolis, Ind.  
Heating Equipment Co., San Francisco.  
Holly Heating & Mfg. Co., So. Pasadena, Cal.  
Huwer Heating Corp., Detroit.  
Ideal Furnace Co., Detroit.  
Kent Co., Inc., J. King, St. Louis.  
Leeson Air Conditioning Corporation, Detroit.  
Lennox Furnace Co., Marshalltown, Ia.  
●Lochinvar Products, Div. Michigan Tank and Furnace  
Corp., Dearborn, Mich.  
Majestic Co., Huntington, Ind.  
Marion Furnace Co., Detroit.  
●May-Fiebeger Company, Newark, Ohio.  
●Mayflower Air Conditioners, Inc., St. Paul, Minn.  
●Meyer Furnace Company, Peoria, Ill.  
●Michigan Tank & Furnace Corp., Detroit.  
●Morrison Steel Products, Inc., Buffalo, N. Y.  
●Mueller Furnace Company, L. J., Milwaukee.  
National Manufacturing & Eng. Co., Detroit.  
●Olsen Manufacturing Co., C. A., Elyria, Ohio.  
●Pacific Gas Radiator Company, Huntington Park, Cal.  
Palmer Manufacturing Corp., Phoenix, Ariz.  
Parker Heating & Mfg. Co., St. Petersburg, Fla.  
●Patten Co., J. V., Sycamore, Ill.  
●Payne Furnace & Supply Co., Beverly Hills, Cal.

Pennsylvania Furnace & Iron Co., Warren, Pa.  
Perfection Stove Co., Cleveland.  
Reznor Manufacturing Co., Merced, Pa.  
●Round Oak Co., Dowagiac, Mich.  
●Royal Air Conditioning Equip. Co., Alhambra, Cal.  
Rudy Furnace Co., Dowagiac, Mich.  
●St. Louis Furnace Manufacturing Co., St. Louis.  
Season-Aire Corporation of America, Detroit.  
Security Manufacturing Co., Kansas City, Mo.  
Viking Mfg. Corp., Dayton, Ohio.  
Wayne Oil Burner Corporation, Fort Wayne, Ind.  
Westinghouse Electric & Mfg. Co., Springfield, Mass.  
●Wood Industries, Inc., Gar, Detroit.

#### FURNACES, WARM AIR, AIR CONDITIONING, UTILITY ROOM, OIL, STEEL

(Complete matched furnace with burner, fan, filter, humidifier)

Airtemp Div., Chrysler Corporation, Dayton, Ohio.  
American Furnace Co., St. Louis.  
American Stove Company, Lorain Div., Lorain, Ohio.  
Auburn Burner Company, Auburn, Ind.  
●Bard Manufacturing Co., Bryan, Ohio.  
Carrier Corporation, Syracuse, N. Y.  
Cleveland Steel Products Corporation, Torridheet Div.,  
Cleveland.  
Dalzen Manufacturing Co., Detroit, Mich.  
●Dowagiac Steel Furnace Company, Dowagiac, Mich.  
Duo-Therm Division, Motor Wheel Corporation, Lansing,  
Mich.  
Evanoil Heater Div., Evans Products Co., Detroit.  
Fluid Heat Division, Anchor Post Fence Company, Balti-  
more.  
Gasoroll Mfg. Corp., Genoa City, Wis.  
●General Electric Company, Bloomfield, N. J.  
●Henry Furnace & Foundry Co., Inc., Cleveland.  
●Hall-Neal Furnace Co., Indianapolis, Ind.  
Harvey-Whipple, Inc., Springfield, Mass.  
Hoffman Specialty Company, Inc., Indianapolis, Ind.  
Huwer Heating Corp., Detroit.  
Ideal Furnace Co., Detroit.  
Interstate Metal Products Company, Inc., Chicago.  
Joliet Heating Corporation, Joliet, Ill.  
Kruse Company, Indianapolis, Ind.  
Lennox Furnace Co., Marshalltown, Iowa.  
●Little Burner Co., Inc., H. C., San Rafael, Cal.  
●Lochinvar Products Div., Michigan Tank & Furnace Corp.,  
Dearborn, Mich.  
McPherson Furnace & Supply Co., Portland, Ore.  
Majestic Company, Huntington, Ind.  
Marion Furnace Co., Detroit.  
●May-Fiebeger Company, Newark, Ohio.  
Montag Stove & Furnace Works, Portland, Ore.  
●Morrison Steel Products, Inc., Buffalo, N. Y.  
●Mueller Furnace Company, L. J., Milwaukee.  
National Manufacturing & Eng. Co., Detroit.  
●Norge Heating & Conditioning Div., Borg-Warner Corp.,  
Detroit.  
Northwest Stove & Furnace Works, Portland, Ore.  
Parker Heating & Mfg. Co., St. Petersburg, Fla.  
●Patten Co., J. V., Sycamore, Ill.  
Perfection Stove Co., Cleveland.  
●Premier Furnace Company, Dowagiac, Mich.  
Progressive Company, Chicago.  
Quaker Mfg. Co., Chicago.  
●Round Oak Co., Dowagiac, Mich.  
Sandberg Co., H. J., Portland, Ore.  
Season-Aire Corporation of America, Detroit.  
Silent Sioux Oil Burner Corp., Orange City, Iowa.  
Viking Manufacturing Corp., Dayton, Ohio.  
Wayne Oil Burner Corp., Fort Wayne, Ind.  
Westinghouse Electric & Mfg. Co., Springfield, Mass.  
Weatherall Engineers, Inc., Providence, R. I.  
●Wood Industries, Inc., Gar, Detroit.  
York Ice Machinery Corporation, York, Pa.  
York Oil Burner Company, Inc., York, Pa.

#### FURNACES, WARM AIR, FLOOR, GRAVITY (For suspension beneath floor)

AireOzone Corporation, Chicago, (Oil).  
Aladdin Heating Corp., Oakland, Cal.  
Allied Heating & Air Conditioning Co., Lawndale, Cal.  
●American Radiator & Standard Sanitary Corp., Pittsburgh.  
(Gas)  
Andes Range & Furnace Corp., Geneva, N. Y.  
Atlas Heating & Ventilating Co., Ltd., San Francisco, Cal.  
Beck Engineering Combustion Company, St. Louis.  
Capps, Joseph, Inc., South Gate, Cal.  
●Cole Hot Blast Manufacturing Co., Chicago. (Gas and Oil)  
Coleman Lamp & Stove Co., Wichita, Kan.  
Dallman Supply Co., Sacramento, Cal.  
Day & Night Manufacturing Co., Monrovia, Cal. (Gas)  
East Anaheim Sheet Metal Works, Long Beach, Cal.  
Electrogas Furnace Co., San Francisco, Cal. (Gas)  
Essick Manufacturing Co., Los Angeles, Cal.  
Famillan Pipe & Supply Co., Los Angeles, Cal.  
Fraser and Johnston Co., San Francisco.  
●Gillen Company, J. L., Dowagiac, Mich.  
Heating Equipment Co., San Francisco. (Gas)  
Holley Heating & Mfg. Co., So. Pasadena, Cal.  
Hotstream Heater Co., Cleveland.



- Ideal Heating Corp., Los Angeles. (Gas)
- King Metal Co., Oklahoma City, Okla.
- Koons Furnace Co., Danville, Ill.
- Little Burner Co., Inc., H. C., San Rafael, Cal. (Oil)
- Mayfair Furnace Co., Hollywood, Cal.
- Miller Floor Furnace Co., Oakland, Cal.
- Mission Water Heater Co., Los Angeles, Cal.
- Monarch Heating Co., Los Angeles.
- Moncrief Furnace & Mfg. Co., Inc., Dallas, Tex.
- Moore Corporation, Joliet, Ill.
- Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill. (Gas)
- Mueller Furnace Co., L. J., Milwaukee, Wis. (Gas)
- Norge Heating & Cond. Div., Borg-Warner Corp., Detroit. (Oil)
- Ohio Foundry & Mfg. Co., Steubenville, O.
- O'Keefe & Merritt Co., Los Angeles.
- Pacific Gas Heating Co., San Francisco (Gas)
- Pacific Gas Radiator Co., Huntington Park, Cal.
- Palmer Manufacturing Corp., Phoenix, Ariz.
- Payne Furnace & Supply Co., Beverly Hills, Cal. (Gas)
- Pennsylvania Furnace & Iron Co., Warren, Pa. (Gas)
- Pioneer Water Heater Co., Los Angeles.
- Quaker Manufacturing Co., Chicago. (Oil)
- Rock Island Stove Co., Rock Island, Ill. (Coal)
- Royal Air Conditioning Equipment, Compton, Cal. (Gas)
- Stephens Mfg. Co., Tulsa, Okla.
- Stoker-Lad, Inc., Tacoma, Wash.
- Surface Combustion Corp., Toledo, O. (Gas)
- Sutphen & Co., J. W., Los Angeles.
- Tennessee Enamel Mfg. Co., Nashville, Tenn.
- U-Ni-Matic Heating Systems, Inc., Los Angeles, Cal. (Gas)
- Utility Fan Corporation, Los Angeles. (Gas, Butane)
- Ward Heater Company, Los Angeles, Cal. (Gas)
- Woods-Evertz Stove Co., Springfield, Mo.
- Zink Co., John, Tulsa, Okla. (Gas)

## FURNACES, WARM AIR, GRAVITY, COAL, CAST IRON

- Adelta Manufacturing Co., Philadelphia.
- Agricola Furnace Co., Inc., Gadsden, Ala.
- Airtemp Div., Chrysler Corp., Dayton, Ohio.
- American Foundry & Furnace Co., Bloomington, Ill.
- American Furnace Co., St. Louis, Mo.
- American Furnace & Foundry Co., Milan, Mich.
- American Radiator and Standard Sanitary Corp., Pittsburgh.
- Andes Range & Furnace Corp., Geneva, N. Y.
- Barry Furnace Co., Hamilton, O.
- Bergstrom Mfg. Corp., Neenah, Wis.
- Bovee Furnace Works, Waterloo, Ia.
- Brillion Furnace Co., Brillion, Wis.
- Chandler Co., Cedar Rapids, Ia.
- Cleveland Steel Products Corp., Toridheet Div., Cleveland.
- Columbus Heating & Ventilating Co., Columbus, O.
- Danville Stove & Mfg. Co., Danville, Pa.
- Detroit-Michigan Stove Co., Detroit, Mich.
- Dowagiac Steel Furnace Company, Dowagiac, Mich.
- Edwards Furnace Co., Wellsboro, Pa.
- Enterprise Foundry Co., Belleville, Ill.
- Excelsior Steel Furnace Co., Chicago, Ill.
- Excelsior Stove & Mfg. Co., Quincy, Ill.
- Farris Furnace Co., Springfield, Ill.
- Faultless Heater Corp., Cleveland, O.
- Favorite Stove Co., Piqua, O.
- Floyd-Wells Co., Royersford, Pa.
- Foot Foundry Co., J. B., Fredericktown, O.
- Forest City Foundries Co., Cleveland, O.
- Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
- Fuller-Warren Co., Milwaukee, Wis.
- Green Colonial Furnace Co., Des Moines, Ia.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Hallstead Iron Foundry, Hallstead, Pa.
- Hart & Crouse Corporation, Utica, N. Y.
- Hart Mfg. Co., Louisville, Ky.
- Henry Furnace & Foundry Co., Cleveland, O.
- Hess-Snyder Co., Massillon, O.
- Home Furnace Co., Holland, Mich.
- Home Stove Co., Indianapolis, Ind.
- Homer Furnace & Foundry Corp., Coldwater, Mich.
- Ideal Furnace Co., Detroit, Mich.
- Independence Stove & Furnace Co., Independence, Mo.
- International Heater Co., Utica, N. Y.
- Iowa Foundry Co., Sioux City, Ia.
- Katelman Foundry & Mfg. Co., Council Bluffs, Iowa.
- Keith Furnace Co., Des Moines, Ia.
- Kelsey Heating Co., Syracuse, N. Y.
- Klein Stove Co., Philadelphia, Pa.
- MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
- Majestic Co., Huntington, Ind.
- Maple City Furnace Co., Monmouth, Ill.
- Marshall Furnace Co., Marshall, Mich.
- May-Fieberger Co., Newark, O.
- Meyer Furnace Co., Peoria, Ill.
- Miller Range & Furnace Co., Wm., Cincinnati, O.
- ModernAire Co., Div. Des Moines Stove Repair Co., Des Moines, Ia.
- Montag Stove & Furnace Works, Portland, Ore.
- Moore Corp., Joliet, Ill.
- Mount Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
- Mueller Furnace Co., L. J., Milwaukee, Wis.

- Oakland Foundry Co., Belleville, Ill.
- Olsen Mfg. Co., C. A., Elyria, O.
- Orbon Stove Co., Belleville, Ill.
- Peerless Foundry Co., Indianapolis, Ind.
- Pittsburgh Furnace Parts Co., Pittsburgh, Pa.
- Pittston Stove Co., Pittston, Pa.
- Portland Stove Foundry Co., Portland, Me.
- Premier Furnace Co., Dowagiac, Mich.
- Reynolds Manufacturing Co., Springfield, Mo.
- Robinson Furnace Co., Chicago, Ill.
- Rock Island Stove Co., Rock Island, Ill.
- Rosebraugh Co., W. W., Salem, Ore.
- Round Oak Co., Dowagiac, Mich.
- Rudy Furnace Co., Dowagiac, Mich.
- Rybolt Heater Co., Ashland, O.
- St. Clair Foundry Corp., Centralia, Ill.
- St. Louis Furnace Mfg. Co., St. Louis, Mo.
- Schill Mfg. Co., Crestline, O.
- Schwab Furnace Co., Milwaukee, Wis.
- Sioux City Foundry and Boiler Co., Sioux City, Ia.
- Spear Stove and Heater Co., James, Philadelphia.
- Standard Furnace & Supply Co., Omaha, Nebr.
- Thatcher Furnace Co., Newark, N. J.
- Twentieth Century Heating & Ventilating Co., Akron, O.
- Union Manufacturing Co., Inc., Boyertown, Pa.
- United States Radiator Corp., Detroit, Mich.
- Washington Stove Works, Everett, Wash.
- Western Furnaces, Inc., Tacoma, Wash.
- Westwick & Son, Inc., John, Galena, Ill.
- Williamson Heater Co., Cincinnati, O.
- Wise Furnace Co., Akron, O.
- XXth Century Heating & Ventilating Co., Akron, O.

## FURNACES, WARM AIR, GRAVITY, COAL, STEEL

- Airtemp Div., Chrysler Corp., Dayton, Ohio.
- American Foundry & Furnace Co., Bloomington, Ill.
- American Furnace Co., St. Louis, Mo.
- American Furnace & Foundry Co., Milan, Mich.
- American Radiator and Standard Sanitary Corp., Pittsburgh.
- American Welding & Engineering Corp., Milwaukee, Wis.
- Andrews Heating Co., Minneapolis.
- Arcweld Mfg. Co., Inc., Seattle, Wash.
- Armstrong Furnace Co., Columbus, O.
- Baker Furnace & Cleaner Mfg. Co., Toledo, O.
- Bovee Furnace Works, Waterloo, Ia.
- Campbell Heating Co., Des Moines, Ia.
- Chandler Co., Cedar Rapids, Ia.
- Cleveland Steel Products Corp., Toridheet Div., Cleveland.
- Daniels Mfg. Co., Inc., Sam, Hardwick, Vt.
- Deshler Foundry & Mach. Wks., Deshler, O.
- Dowagiac Steel Furnace Co., Dowagiac, Mich.
- Excelsior Steel Furnace Co., Chicago, Ill.
- Farquhar Furnace Co., Wilmington, O.
- Faultless Heater Corp., Cleveland, O.
- Floral City Co., Monroe, Mich.
- Forest City Foundries Co., Cleveland, O.
- Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
- Gascol Furnace Co., Pittsburgh (Combination Coal and Gas)
- Gehri Co., Tacoma, Wash.
- Green Colonial Furnace Co., Des Moines, Ia.
- Grossenbacher Furnace Co., St. Louis, Mo.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Hart Mfg. Co., Louisville, Ky.
- Henry Furnace & Foundry Co., Cleveland, O.
- Hess-Snyder Co., Massillon, O.
- Hess Warming & Ventilating Co., Chicago, Ill.
- Home Stove Co., Indianapolis, Ind.
- Homer Furnace & Foundry Corp., Coldwater, Mich.
- Ideal Furnace Co., Detroit, Mich.
- Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
- International Heater Co., Utica, N. Y.
- Joliet Heating Corp., Joliet, Ill.
- Keith Furnace Co., Des Moines, Ia.
- Koons Furnace Co., Danville, Ill.
- Kruse & Dewenter Co., Indianapolis, Ind.
- Leader Iron Works, Decatur, Ill.
- Lee Furnace Co., South Bend, Ind.
- Lennox Furnace Co., Marshalltown, Ia.
- Lookout Boiler & Mfg. Co., Chattanooga, Tenn.
- McLouth Air Conditioning Corp., Lansing, Mich.
- McPherson Furnace & Supply Co., Portland, Ore.
- Majestic Co., Huntington, Ind.
- Majestic Furnace Co., Seattle, Wash.
- Marshall Furnace Co., Marshall, Mich.
- May-Fieberger Co., Newark, O.
- Meyer Furnace Co., Peoria, Ill.
- Michigan Tank & Furnace Corp., Detroit.
- ModernAire Co., Div. Des Moines Stove Repair Co., Des Moines, Ia.
- Montag Stove & Furnace Works, Portland, Ore.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- National Mfg. & Engineering Co., Detroit.
- Northwest Stove & Furnace Works, Portland, Ore.
- Nugent Furnaces, Thos., New York City.
- Olsen Mfg. Co., C. A., Elyria, O.
- Parker Heating & Mfg. Co., St. Petersburg, Fla.
- Peerless Foundry Co., Indianapolis, Ind.
- Pennsylvania Engineering Works, New Castle, Pa.
- Pennsylvania Furnace & Iron Co., Warren, Pa.

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Pittsburgh Furnace Parts Co., Pittsburgh, Pa.  
 Portland Stove Foundry Co., Portland, Me.  
 ●Premier Furnace Co., Dowagiac, Mich.  
 Ramey Mfg. Co., Columbus, O.  
 Ribside Furnace Co., Wausau, Wis.  
 Roberts-Hamilton Co., Minneapolis, Minn.  
 Robinson Furnace Co., Chicago.  
 ●Round Oak Co., Dowagiac, Mich.  
 Rudy Furnace Co., Dowagiac, Mich.  
 ●Rybolt Heater Co., Ashland, O.  
 ●St. Louis Furnace Mfg. Co., St. Louis.  
 Sandberg Co., H. J., Portland, Ore.  
 Schill Mfg. Co., Crestline, O.  
 Schwab Furnace Co., Milwaukee, Wis.  
 Sioux City Foundry and Boiler Co., Sioux City, Ia.  
 Spencer Heater Div., Aviation Mfg. Corp., Williamsport, Pa.  
 Standard Furnace & Supply Co., Omaha, Nebr.  
 Stanton Heater Co., Martins Ferry, Ohio.  
 Sure Comfort Furnace Co., Berwyn, Ill.  
 Synchronic Air Conditioning Corporation, Milwaukee.  
 Thatcher Furnace Company, Newark, N. J.  
 Twentieth Century Heating & Ventilating Co., Akron, O.  
 United States Radiator Corp., Detroit.  
 ●Waterman-Waterbury Co., Minneapolis, Minn.  
 Westinghouse Electric & Mfg. Co., Springfield, Mass.  
 Wheeling Furnace Corporation, Martins Ferry, Ohio.  
 ●Williamson Heater Co., Cincinnati, O.  
 ●Wise Furnace Co., Akron, O.  
 XXth Century Heating & Ventilating Co., Akron, O.

#### FURNACES, WARM AIR, GRAVITY, GAS, CAST IRON

American Foundry & Furnace Co., Bloomington, Ill.  
 American Furnace Co., St. Louis, Mo.  
 Bryant Heater Co., Cleveland, O.  
 Burke Stoker & Mfg. Co., Chicago.  
 ●Chandler Co., Cedar Rapids, Ia.  
 Cleveland Steel Products Corp., Toridheet Div., Cleveland.  
 Favorite Stove Co., Piqua, O.  
 ●Forest City Foundries Co., Cleveland, O.  
 Hart Mfg. Co., Louisville, Ky.  
 ●Henry Furnace & Foundry Co., Cleveland.  
 Hess-Snyder Co., Massillon, O.  
 Ideal Furnace Co., Detroit.  
 Jackson Sheet Metal Works, Ogden, Utah. (Combination Iron and Steel)  
 Johnson Gas Furnace Corp., North Hollywood, Cal.  
 Kelsey Heating Co., Syracuse, N. Y.  
 ●Mueller Furnace Co., L. J., Milwaukee, Wis.  
 ●Pacific Gas Radiator Co., Huntington Park, Cal.  
 Richmond Radiator Co., Inc., Uniontown, Pa.  
 Rudy Furnace Co., Dowagiac, Mich.  
 ●Rybolt Heater Company, Ashland, O.  
 Sioux City Foundry & Boiler Co., Sioux City, Ia.  
 ●Surface Combustion Corp., Toledo, O.  
 Twentieth Century Heating & Ventilating Co., Akron, O.  
 ●Wise Furnace Co., Akron, O.  
 XXth Century Heating & Ventilating Co., Akron, O.  
 York Ice Machinery Corporation, York, Pa.

#### FURNACES, WARM AIR, GRAVITY, GAS, STEEL

Airtemp Div., Chrysler Corp., Dayton, Ohio.  
 Aladdin Heating Corp., Oakland, Cal.  
 Allied Heating & Air Conditioning Co., Lawndale, Cal.  
 American Furnace Co., St. Louis, Mo.  
 ●American Radiator and Standard Sanitary Corp., Pittsburgh.  
 American Standard Gas Products Co., Detroit.  
 Andrews Heating Co., Minneapolis.  
 Armstrong Furnace Co., Columbus, O.  
 Atlas Heating & Ventilating Co., Ltd., San Francisco, Cal.  
 ●Bard Manufacturing Company, Bryan, Ohio.  
 Beck Engineering Combustion Kompany, St. Louis.  
 Burke Stoker & Mfg. Co., Chicago.  
 Bryant Corp., C. L., Cleveland O.  
 Burmester Gas Furnace Mfg. Co., Omaha, Nebr. (Sheet Iron)  
 Calkins & Pearce, Columbus, O.  
 Cocking, Geo. J., Santa Ana, Cal.  
 Coleman Lamp & Stove Company, Wichita, Kansas.  
 Dallman Supply Co., Sacramento, Cal.  
 Dornback Furnace & Foundry Co., Cleveland.  
 Electrogas Furnace Co., San Francisco, Cal.  
 Essick Manufacturing Co., Los Angeles.  
 ●Forest City Foundries Co., Cleveland, O.  
 Fraser and Johnston Co., San Francisco.  
 Gascol Furnace Co., Pittsburgh (Comb. Coal and Gas)  
 Green Colonial Furnace Co., Des Moines, Ia.  
 ●Hall-Neal Furnace Co., Indianapolis, Ind.  
 Heating Equipment Co., San Francisco.  
 ●Henry Furnace & Foundry Co., Cleveland.  
 Hess-Snyder Co., Massillon, O.  
 Holley Heating & Mfg. Co., So. Pasadena, Cal.  
 Hotentot Company, Inc., Omaha, Nebr.  
 Ideal Furnace Co., Detroit.  
 Independence Stove & Furnace Co., Independence, Mo.  
 Johnston Gas Furnace Corp., North Hollywood, Cal.  
 Lennox Furnace Co., Marshalltown, Ia.  
 Marlon Furnace Co., Detroit.  
 ●May-Flebege Co., Newark, O.  
 ●Meyer Furnace Co., Peoria, Ill.  
 Mount Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.

●Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.  
 ●Mueller Furnace Co., L. J., Milwaukee, Wis.  
 National Mfg. & Engineering Co., Detroit.  
 New Mission Heating & Ventilating Co., San Francisco.  
 Northern Furnace & Supply Co., Billings, Mont.  
 Nugent Furnaces, Thomas, New York City.  
 ●Olsen Mfg. Co., C. A., Elyria, O.  
 ●Pacific Gas Radiator Co., Huntington Park, Cal.  
 Palmer Manufacturing Corp., Phoenix, Ariz.  
 Parker Heating & Manufacturing Co., St. Petersburg, Fla.  
 ●Payne Furnace & Supply Co., Beverly Hills, Cal.  
 Pennsylvania Furnace & Iron Co., Warren, Pa.  
 Perfection Stove Co., Cleveland.  
 Reznor Manufacturing Co., Mercer, Pa.  
 ●Royal Air Conditioning Equipment, Alhambra, Cal.  
 Rudy Furnace Co., Dowagiac, Mich.  
 ●Rybolt Heater Co., Ashland, O.  
 Ryniker Sheet Metal Works, Billings, Mont.  
 ●St. Louis Furnace Mfg. Co., St. Louis.  
 Schill Mfg. Co., Crestline, Ohio.  
 Scott-Newcomb, Inc., St. Louis, Mo.  
 Season-Alre Corporation of America, Detroit.  
 Sonner Burner Co., Winfield, Kansas.  
 Twentieth Century Heating & Ventilating Co., Akron, O.  
 United States Radiator Corp., Detroit.  
 ●Waterman-Waterbury Co., Minneapolis, Minn.  
 Westinghouse Electric & Mfg. Co., Springfield, Mass.  
 ●Williamson Heater Co., Cincinnati, O.  
 ●Wise Furnace Co., Akron, O.  
 XXth Century Heating & Ventilating Co., Akron, O.

#### FURNACES, WARM AIR, GRAVITY, OIL, CAST IRON

Adelta Manufacturing Co., Philadelphia.  
 American Furnace & Foundry Co., Milan, Mich.  
 ●American Radiator & Standard Sanitary Corp., Pittsburgh.  
 ●Chandler Co., Cedar Rapids, Iowa.  
 Edwards Furnace Co., Wellsboro, Pa.  
 Hart & Crouse Corporation, Utica, N. Y.  
 Hess-Snyder Co., Massillon, Ohio.  
 Ideal Furnace Co., Detroit.  
 International Heater Co., Utica, N. Y.  
 Keith Furnace Co., Des Moines, Ia.  
 Kelsey Heating Co., Syracuse, N. Y.  
 Mount Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.  
 Montag Stove & Furnace Works, Portland, Ore.  
 ●Mueller Furnace Co., L. J., Milwaukee.  
 ●St. Louis Furnace Mfg. Co., St. Louis.  
 Sioux City Foundry & Boiler Co., Sioux City, Ia.  
 Thatcher Furnace Company, Newark, N. J.

#### FURNACES, WARM AIR, GRAVITY, OIL, STEEL

Airtemp Division, Chrysler Corp., Dayton, Ohio.  
 American Air Conditioning Corp., Sebastopol, Cal.  
 American Furnace & Foundry Co., Milan, Mich.  
 American Furnace Co., St. Louis, Mo.  
 ●American Radiator and Standard Sanitary Corp., Pittsburgh.  
 American Welding & Engineering Corp., Milwaukee.  
 Andrews Heating Co., Minneapolis.  
 Arcweld Mfg. Co., Inc., Seattle, Wash.  
 Armstrong Furnace Co., Columbus, O.  
 Baker Furnace & Cleaner Mfg. Co., Toledo, O.  
 ●Bard Manufacturing Co., Bryan, O.  
 Beck Engineering Combustion Kompany, St. Louis.  
 Campbell Heating Co., Des Moines, Ia.  
 Cary Mfg. Co., Waupaca, Wis.  
 ●Chandler Company, Cedar Rapids, Ia.  
 Duo-Therm Division, Motor Wheel Corporation, Lansing, Mich.  
 Economy Baler Co., Ann Arbor, Mich.  
 Essick Manufacturing Co., Los Angeles.  
 Evanoll Heater Div., Evans Products Co., Detroit.  
 Farquhar Furnace Co., Wilmington, O.  
 ●Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.  
 Gasoroll Mfg. Corp., Genoa City, Wis.  
 Gehrl Co., Tacoma, Wash.  
 Gilbert & Barker Mfg. Co., Springfield, Mass.  
 ●Gillen Company, J. L., Dowagiac, Mich.  
 Green Colonial Furnace Co., Des Moines, Ia.  
 ●Hall-Neal Furnace Co., Indianapolis, Ind.  
 Hess-Snyder Co., Massillon, Ohio.  
 ●Hess Warming & Ventilating Co., Chicago.  
 Hotentot Co., Inc., Omaha, Nebr.  
 Ideal Furnace Co., Detroit.  
 Johnston Gas Furnace Corp., North Hollywood, Cal.  
 Joliet Heating Corp., Joliet, Ill.  
 Keith Furnace Co., Des Moines, Ia.  
 Knowles Air Conditioning, Minneapolis.  
 Koons Furnace Co., Danville, Ill.  
 Kruse Company, Indianapolis, Ind.  
 Kruse & Dewenter Co., Indianapolis, Ind.  
 Lee Furnace Co., South Bend, Ind.  
 Lennox Furnace Co., Marshalltown, Ia.  
 ●Little Burner Co., Inc., H. C., San Rafael, Cal.  
 ●Lochinvar Products Div., Michigan Tank & Furnace Corp., Dearborn, Mich.  
 McLouth Air Conditioning Corp., Lansing, Mich.  
 ●May-Flebege Co., Newark, Ohio.  
 ●Meyer Furnace Co., Peoria, Ill.  
 ●Michigan Tank & Furnace Corp., Detroit.

- Montag Stove & Furnace Works, Portland, Ore.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit, Mich.
- Northwest Stove & Furnace Works, Portland, Ore.
- Nugent Furnaces, Thomas, New York City.
- Olsen Mfg. Co., C. A., Elyria, O.
- Pacific Gas Radiator Co., Huntington Park, Cal.
- Parker Heating & Manufacturing Co., St. Petersburg, Fla.
- Peerless Foundry Co., Indianapolis, Ind.
- Perfection Stove Co., Cleveland, O.
- Portland Stove Foundry Co., Portland, Me.
- Premier Furnace Co., Dowagiac, Mich.
- Progressive Co., Chicago.
- Quaker Manufacturing Co., Chicago.
- Quincy Stove Manufacturing Co., Quincy, Ill.
- Rock Island Stove Co., Rock Island, Ill.
- Rosebraugh Co., W. W., Salem, Ore.
- Round Oak Co., Dowagiac, Mich.
- Rybolt Heater Co., Ashland, Ohio.
- St. Louis Furnace Mfg. Co., St. Louis.
- Sandberg Co., H. J., Portland, Ore.
- Scott-Newcomb, Inc., St. Louis, Mo.
- Sure Comfort Furnace Co., Berwyn, Ill.
- Thatcher Furnace Company, Newark, N. J.
- Twentieth Century Heating & Ventilating Co., Akron, O.
- United States Radiator Corp., Detroit.
- Viking Mfg. Corp., Dayton, Ohio.
- Waterman-Waterbury Co., Minneapolis, Minn.
- Western Blower Company, Seattle, Wash.
- Westinghouse Electric & Mfg. Co., Springfield, Mass.
- Williamson Heater Co., Cincinnati, O.
- Wise Furnace Co., Akron, O.
- XXth Century Heating & Ventilating Co., Akron, O.

### FURNACES, WARM AIR, GRAVITY, STOKER, CAST IRON

- Adelta Manufacturing Co., Philadelphia.
- American Furnace & Foundry Co., Milan, Mich.
- American Radiator and Standard Sanitary Corp., Pittsburgh.
- Anchor Stove & Range Co., New Albany, Ind.
- Bovee Furnace Works, Waterloo, Ia.
- Chandler Co., Cedar Rapids, Ia.
- Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
- Grossenbacher Furnace Co., Inc., St. Louis.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Hess-Snyder Co., Massillon, Ohio.
- Ideal Furnace Co., Detroit.
- Keith Furnace Co., Des Moines, Ia.
- Kelsey Heating Co., Inc., Syracuse, N. Y.
- Majestic Co., Huntington, Ind.
- Meyer Furnace Co., Peoria, Ill.
- Montag Stove & Furnace Works, Portland, Ore.
- Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
- Mueller Furnace Co., L. J., Milwaukee, (Double Radiator)
- Premier Furnace Co., Dowagiac, Mich.
- Rudy Furnace Co., Dowagiac, Mich.
- Schwab Furnace Co., Milwaukee, Wis.
- Sioux City Fdy. & Boiler Co., Sioux City, Ia.
- Twentieth Century Heating & Ventilating Co., Akron, Ohio.
- Wise Furnace Co., Akron, O.
- XXth Century Heating & Ventilating Co., Akron, Ohio.

### FURNACES, WARM AIR, GRAVITY, STOKER, STEEL

- American Furnace Company, St. Louis.
- American Furnace & Foundry Co., Milan, Mich.
- American Radiator & Standard Sanitary Corp., Pittsburgh.
- American Welding & Engineering Corp., Milwaukee.
- Andrews Heating Company, Minneapolis.
- Arcweld Mfg. Co., Inc., Seattle, Wash.
- Armstrong Furnace Co., Columbus, O.
- Baker Furnace & Cleaner Mfg. Co., Toledo, Ohio.
- Beck Engineering Combustion Kompany, St. Louis.
- Floral City Co., Monroe, Mich.
- Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
- Grossenbacher Furnace Co., St. Louis.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Henry Furnace & Foundry Co., Cleveland, O.
- Hess-Snyder Co., Massillon, Ohio.
- Hess Warming & Ventilating Co., Chicago, Ill.
- Ideal Furnace Co., Detroit.
- Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
- Keith Furnace Co., Des Moines, Ia.
- Lee Furnace Co., South Bend, Ind.
- Lennox Furnace Co., Marshalltown, Ia.
- McLouth Air Conditioning Corp., Lansing, Mich.
- Majestic Co., Huntington, Ind.
- May-Fieberger Co., Newark, Ohio.
- Meyer Furnace Co., Peoria, Ill.
- ModernAire Co. Div. Des Moines Stove Repair Co., Des Moines, Ia.
- Montag Stove & Furnace Works, Portland, Ore.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Northwest Stove & Furnace Works, Portland, Ore.
- Olsen Mfg. Co., C. A., Elyria, O.
- Parker Heating & Manufacturing Co., St. Petersburg, Fla.
- Premier Furnace Co., Dowagiac, Mich.

- Round Oak Co., Dowagiac, Mich.
- Rudy Furnace Co., Dowagiac, Mich.
- Rybolt Heater Co., Ashland, Ohio.
- St. Louis Furnace Mfg. Co., St. Louis.
- Schwab Furnace Co., Milwaukee, Wis.
- Spencer Heater Div., Aviation Mfg. Corp., Williamsport, Pa.
- Stok-A-Fire Co., Inc., University City, Mo.
- Sure Comfort Furnace Co., Berwyn, Ill.
- Twentieth Century Heating & Ventilating Co., Akron, O.
- Waterman-Waterbury Co., Minneapolis, Minn.
- Westinghouse Electric & Mfg. Co., Springfield, Mass.
- Williamson Heater Co., Cincinnati, O.
- Wise Furnace Co., Akron, O.
- XXth Century Heating & Ventilating Co., Akron, O.

### FURNACES, WARM AIR, HORIZONTAL

- Acme Heating & Ventilating Co., Chicago, Ill.
- American Foundry & Furnace Co., Bloomington, Ill.
- Andrews Heating Co., Minneapolis.
- Arcweld Mfg. Co., Inc., Seattle, Wash.
- Bovee Furnace Works, Waterloo, Ia.
- Campbell Heating Co., E. K., Kansas City, Mo.
- Columbus Heating & Ventilating Co., Columbus, O.
- Floral City Co., Monroe, Mich.
- MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
- Majestic Co., Huntington, Ind.
- McPherson Furnace & Supply Co., Portland, Ore.
- Monerief Furnace Co., Atlanta, Ga.
- Montag Stove & Furnace Works, Portland, Ore.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- National Manufacturing & Engineering Co., Detroit.
- Northwest Stove & Furnace Works, Portland, Ore.
- Parker Heating & Manufacturing Co., St. Petersburg, Fla.
- Ramey Mfg. Co., Columbus, O.
- Rosebraugh Co., W. W., Salem, Ore.
- Sandberg Co., H. J., Portland, Ore.
- Thermal Engineering Associates, Chicago.
- Twentieth Century Heating & Ventilating Co., Akron, O.
- Western Blower Company, Seattle, Wash.
- Western Furnaces, Inc., Tacoma, Wash.
- XXth Century Heating & Ventilating Co., Akron, O.

### FURNACES, WARM AIR, PIPELESS, CAST IRON

- Agricola Furnace Co., Inc., Gadsden, Ala.
- Airtherm Mfg. Co., St. Louis.
- American Foundry & Furnace Co., Bloomington, Ill.
- American Furnace Co., St. Louis, Mo.
- American Furnace & Foundry Co., Milan, Mich.
- American Radiator and Standard Sanitary Corp., Pittsburgh.
- Andes Range & Furnace Corp., Geneva, N. Y.
- Barry Furnace Co., Hamilton, O.
- Brillion Furnace Co., Brillion, Wis.
- Chandler Co., Cedar Rapids, Ia.
- Cleveland Steel Products Corp., Toridheet Div., Cleveland.
- Danville Stove & Mfg. Co., Danville, Pa.
- Dowagiac Steel Furnace Co., Dowagiac, Mich.
- Enterprise Foundry Co., Belleville, Ill.
- Excelsior Steel Furnace Co., Chicago, Ill.
- Excelsior Stove & Mfg. Co., Quincy, Ill.
- Favorite Stove Co., Piqua, O.
- Floyd-Wells Co., Royersford, Pa.
- Forest City Foundries Co., Cleveland, O.
- Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
- Grossenbacher Furnace Co., Inc., St. Louis.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Hart & Crouse Corporation, Utica, N. Y.
- Hart Mfg. Co., Louisville, Ky.
- Henry Furnace & Foundry Co., Cleveland, O.
- Home Furnace Co., Holland, Mich.
- Home Stove Co., Indianapolis, Ind.
- Homer Furnace & Foundry Corp., Coldwater, Mich.
- Ideal Furnace Co., Detroit, Mich.
- Independence Stove & Furnace Co., Independence, Mo.
- International Heater Company, Utica, N. Y.
- Keith Furnace Co., Des Moines, Ia.
- Kelsey Heating Co., Syracuse, N. Y.
- MaGirl Foundry and Furnace Works, P. H., Bloomington, Ill.
- Maple City Furnace Co., Monmouth, Ill.
- Marshall Furnace Co., Marshall, Mich.
- May-Fieberger Co., Newark, O.
- Meyer Furnace Co., Peoria, Ill.
- Montag Stove & Furnace Works, Portland, Ore.
- Moore Corp., Joliet, Ill.
- Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Olsen Mfg. Co., C. A., Elyria, O.
- Orbon Stove Co., Belleville, Ill.
- Pittsburgh Furnace Parts Co., Pittsburgh, Pa.
- Pittston Stove Co., Pittston, Pa.
- Portland Stove Foundry Co., Portland, Me.
- Premier Furnace Co., Dowagiac, Mich.
- Ravenna Furnace & Heating Co., Ravenna, O.
- Robinson Furnace Co., Chicago, Ill.
- Rudy Furnace Co., Dowagiac, Mich.
- Rybolt Heater Co., Ashland, O.
- St. Clair Foundry Corp., Centralia, Ill.
- St. Louis Furnace Mfg. Co., St. Louis, Mo.
- Schill Mfg. Co., Crestline, O.

● Advertisement in this issue. See Index to Advertisers, page 310



Schwab Furnace Co., Milwaukee, Wis.  
 Sioux City Foundry & Boiler Co., Sioux City, Iowa.  
 Spear Stove and Heater Co., James, Philadelphia.  
 Stiglitz Furnace & Foundry Co., Louisville, Ky.  
 Thatcher Furnace Co., Newark, N. J.  
 Twentieth Century Heating & Ventilating Co., Akron, O.  
 United States Radiator Corp., Detroit, Mich.  
 Washington Stove Works, Everett, Wash.  
 Western Furnaces, Inc., Tacoma, Wash.  
 Westwick & Son, Inc., John, Galena, Ill.  
 ●Williamson Heater Co., Cincinnati, O.  
 ●Wise Furnace Co., Akron, O.  
 XXth Century Heating & Ventilating Co., Akron, O.

### FURNACES, WARM AIR, PIPELESS, STEEL

Airtherm Manufacturing Co., St. Louis.  
 Aladdin Heating Corp., Oakland, Cal.  
 American Furnace & Foundry Co., Milan, Mich.  
 Andrews Heating Co., Minneapolis.  
 Arcweld Manufacturing Co., Inc., Seattle, Wash.  
 Armstrong Furnace Co., Columbus, O.  
 Campbell Heating Co., Des Moines, Ia.  
 Cleveland Steel Products Corp., Toridheet Div., Cleveland.  
 Daniels Mfg. Co., Inc., Sam, Hardwick, Vt.  
 ●Dowagiac Steel Furnace Co., Dowagiac, Mich.  
 Grossenbacher Furnace Co., St. Louis.  
 Hart Mfg. Co., Louisville, Ky.  
 ●Henry Furnace & Foundry Co., Cleveland, O.  
 ●Hess Warming & Ventilating Co., Chicago, Ill.  
 Home Stove Co., Indianapolis, Ind.  
 Ideal Furnace Co., Detroit, Mich.  
 International Heater Co., Utica, N. Y.  
 Keith Furnace Co., Des Moines, Ia.  
 Kelsey Heating Co., Syracuse, N. Y.  
 Koons Furnace Co., Danville, Ill.  
 Kruse & Dewenter Co., Indianapolis, Ind.  
 Lennox Furnace Co., Marshalltown, Ia.  
 Majestic Furnace Co., Seattle, Wash.  
 ●May-Flebeiger Co., Newark, O.  
 ●Meyer Furnace Co., Peoria, Ill.  
 ●Michigan Tank & Furnace Corp., Detroit.  
 Montag Stove & Furnace Works, Portland, Ore.  
 Northwest Stove & Furnace Works, Portland, Ore.  
 Nugent Furnaces, Thos., New York City.  
 ●Olsen Mfg. Co., C. A., Elyria, O.  
 Orbon Stove Co., Belleville, Ill.  
 ●Peerless Foundry Co., Indianapolis, Ind.  
 Pennsylvania Furnace & Iron Co., Warren, Pa.  
 Pittsburgh Furnace Parts Co., Pittsburgh, Pa.  
 Ramey Mfg. Co., Columbus, O.  
 Roberts-Hamilton Co., Minneapolis, Minn.  
 Rosebraugh Co., W. W., Salem, Ore.  
 ●St. Louis Furnace Mfg. Co., St. Louis, Mo.  
 Schwab Furnace Co., Milwaukee, Wis.  
 Stanton Heater Co., Martins Ferry, O.  
 Stiglitz Furnace & Foundry Co., Louisville, Ky.  
 Twentieth Century Heating & Ventilating Co., Akron, O.  
 ●Waterman-Waterbury Co., Minneapolis, Minn.  
 Westinghouse Electric & Mfg. Co., Springfield, Mass.  
 ●Wise Furnace Co., Akron, O.  
 XXth Century Heating & Ventilating Co., Akron, O.

### FURNACES, WARM AIR, WOOD BURNING, CAST IRON

American Furnace Co., St. Louis.  
 Hart & Crouse Corporation, Utica, N. Y.  
 ●Homer Furnace & Foundry Corp., Coldwater, Mich.  
 International Heater Co., Utica, N. Y.  
 Keith Furnace Co., Des Moines, Ia.  
 MaGirl Foundry and Furnace Works, P. H., Bloomington, Ill.  
 Majestic Company, Huntington, Ind.  
 Moncrief Furnace & Mfg. Co., Dallas, Tex.  
 Montag Stove & Furnace Works, Portland, Ore.  
 ●Mueller Furnace Co., L. J., Milwaukee, Wis.  
 Oakland Foundry Co., Belleville, Ill.  
 Portland Stove Foundry Co., Portland, Me.  
 Schwab Furnace Co., Milwaukee, Wis.  
 Western Furnaces, Inc., Tacoma, Wash.

### FURNACES, WARM AIR, WOOD BURNING, STEEL

American Furnace Co., St. Louis.  
 American Welding & Engineering Corp., Milwaukee, Wis.  
 Andrews Heating Co., Minneapolis.  
 Arcweld Manufacturing Co., Inc., Seattle, Wash.  
 Bovee Furnace Works, Waterloo, Ia.  
 Campbell Heating Co., E. K., Kansas City, Mo.  
 Daniels Mfg. Co., Inc., Sam, Hardwick, Vt.  
 ●Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.  
 Grossenbacher Furnace Co., St. Louis.  
 ●Henry Furnace & Foundry Co., Cleveland.  
 ●Hess Warming & Ventilating Co., Chicago, Ill.  
 Lennox Furnace Co., Marshalltown, Ia.  
 McLouth Air Conditioning Corp., Lansing, Mich.  
 McPherson Furnace & Supply Co., Portland, Ore. (Also Sawdust)  
 ●Meyer Furnace Co., Peoria, Ill.  
 Moncrief Furnace & Mfg. Co., Dallas, Texas.

Montag Stove & Furnace Works, Portland, Ore.  
 Northwest Stove & Furnace Works, Portland, Ore.  
 Nugent Furnaces, Thomas, New York City.  
 Parker Heating & Mfg. Co., St. Petersburg, Fla.  
 Rosebraugh Co., W. W., Salem, Ore.  
 Sandberg Co., H. J., Portland, Ore.  
 Schwab Furnace Co., Milwaukee, Wis.

### GAGES, AIR FILTER

Air Filter Engineering Co., Chicago.  
 Defender Automatic Regulator Co., St. Louis.  
 Dwyer Mfg. Co., F. W., Chicago.  
 Ellison Draft Gage Co., Chicago.  
 Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.  
 Hays Corporation, Michigan City, Ind.  
 Herbusch Corporation, Simplex Control Div., St. Louis.  
 Hill Co., E. Vernon, Chicago.  
 Huyette Co., Inc., Paul B., Philadelphia.  
 Meriam Co., Cleveland.

### GAS BURNERS

*See Burners, Gas*

### GAGES, INDICATING, DRAFT, PORTABLE

American Schaeffer & Budenberg Instrument Div., Manning, Maxwell & Moore, Inc., Bridgeport, Conn.  
 Bacharach Industrial Instrument Co., Pittsburgh, Pa.  
 Chase Brass & Copper Co., Incorporated, Waterbury, Conn.  
 Defender Automatic Regulator Co., St. Louis.  
 Detroit Air Conditioning Service Co., Inc., Detroit.  
 Dwyer Mfg. Co., F. W., Chicago.  
 Ellison Draft Gage Co., Chicago, Ill.  
 Foxboro Co., Foxboro, Mass.  
 Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore, Md.  
 Hays Corp., Michigan City, Ind.  
 Hill Co., E. Vernon, Chicago, Ill.  
 Hotstream Heater Co., The, Cleveland, O.  
 Marsh Corporation, Jas. P., Chicago.  
 ●Marshalltown Manufacturing Co., Marshalltown, Iowa.  
 Meriam Co., Cleveland, O.  
 Moeller Instrument Co., New York City.  
 Precision Thermometer & Instrument Co., Philadelphia, Pa.  
 Preferred Utilities Mfg. Corp., New York City.  
 Scientific Instrument Co., Detroit.  
 Taylor Instrument Companies, Rochester, N. Y.  
 Uehling Instrument Co., Paterson, N. J.  
 Weaver Mfg. Co., Springfield, Ill.

### GATES, BLAST

*See Blast Gates*

### GLASS, SAFETY

Saftee Glass Co., Philadelphia.

### GLASS, WIRE, FOR SKYLIGHTS

Atcheson Glass Co., T. J., Buffalo.  
 Mississippi Glass Company, New York City.  
 Pennsylvania Wire Glass Co., Philadelphia.  
 Pittsburgh Plate Glass Co., Pittsburgh.

### GLAZING COMPOUNDS

*See Compounds, Glazing*

### GRILLES, HEATING AND VENTILATING

Acme Tin Plate & Roofing Supply Co., Philadelphia.  
 ●Air Control Products, Inc., Coopersville, Mich.  
 Air Devices, Inc., New York City.  
 Airo-Fin Grille Co., Detroit.  
 American Foundry & Furnace Co., Bloomington, Ill.  
 American Warming & Ventilating Co., Toledo, O.  
 ●Auer Register Co., Cleveland, O.  
 Barber-Colman Company, Rockford, Ill.  
 Beckley Perforating Co., Garwood, N. J.  
 Best Register Co., Milwaukee, Wis.  
 Central Wire & Iron Works, Des Moines, Ia.  
 Char-Gale Mfg. Co., Minneapolis.  
 Chase Brass & Copper Co., Inc., Waterbury, Conn.  
 Cross Engineering Company, Carbondale, Pa.  
 Crown Iron Works, Minneapolis.  
 Decatur Iron & Steel Co., Decatur, Ala.  
 ●Diamond Mfg. Co., Wyoming, Pa.  
 Erdle Perforating Co., Rochester, N. Y.  
 Gilliam Mfg. Co., Detroit.  
 ●Harrington & King Perforating Co., Chicago, Ill.  
 ●Hart & Cooley Mfg. Co., Holland, Mich.  
 Hendrick Mfg. Co., Carbondale, Pa.  
 ●Independent Register Co., Cleveland, O.  
 Jamieson Mfg. Co., Dallas, Texas.  
 Johnston & Chapman Co., Chicago.  
 ●Lamneck Products, Inc., Middletown, Ohio.  
 Lockjoint Wood Products Co., Wichita Kan. (Wood)  
 Manhattan Perforated Metal Co., Inc., Long Island City, N. Y.  
 Metalace Corp., South Boston, Mass.  
 ●Mueller Furnace Co., L. J., Milwaukee, Wis.  
 Mundt & Sons, Charles, Jersey City, N. J.  
 Newman Brothers, Inc., Cincinnati, O.  
 ●Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.  
 Reliable Perforating Co., Chicago, Ill.  
 Roberts-Hamilton Co., Minneapolis, Minn.

- Rock Island Register Co., Rock Island, Ill.
- Schoedinger, F. O., Columbus, Ohio.
- Standard Stamping & Perforating Co., Chicago.
- Trane Co., La Crosse, Wis.
- Tuttle & Bailey, Inc., New Britain, Conn.
- U. S. Air Conditioning Corp., Minneapolis.
- United States Register Co., Battle Creek, Mich.
- Utility Fan Corporation, Los Angeles, Cal.
- Waterloo Register Co., Waterloo, Ia.
- Western Wire & Iron Works, Inc., Chicago, Ill.
- Wickwire Spencer Steel Co., New York City.
- Wooster Art Wood, Inc., Wooster, Ohio. (Wood)

## GRINDERS, BUFFERS, POLISHERS AND SANDERS

*See Buffers, Grinders, Polishers and Sanders*

## GROOVING MACHINES

*See Machines, Grooving*

## GUARDS, SNOW

- Berger Brothers Co., Philadelphia, Pa.
- Boyd & Co., Inc., Chas. P., Philadelphia.
- Cartier & Sons Company, M. N., Providence, R. I.
- Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
- Downs-Smith Brass & Copper Co., New York City.
- Folsom Snow Guard Co., Boston, Mass.
- Hussey & Co., C. G., Pittsburgh, Pa. (Copper)
- Levow, David, New York City.
- Maysteel Products, Inc., Mayville, Wis.
- Royal-Apex Mfg. Corp., Brooklyn, N. Y. (Cast Iron)
- Wickwire Spencer Steel Co., New York City.

## GUNS, SPRAY, METALS

Turner Brass Works, Sycamore, Ill.

## GUNS, SPRAY, PAINT

Blinks Mfg. Co., Chicago, Ill.  
 De Vilbiss Co., Toledo, O.  
 Eclipse Air Brush Company, Inc., Newark, N. J.  
 Electric Sprayit Co., Sheboygan, Wis.  
 Hobart Brothers Company, Troy, O.  
 Imperial Brass Mfg. Co., Chicago, Ill.  
 Matthews & Company, J. H., New York City.  
 Milburn Co., Alexander, Baltimore, Md.  
 Spray Engineering Co., Somerville, Mass.

## GUTTER FORMERS

*See Machines, Gutter Forming*

## GUTTERS

*See Eaves Trough and Gutters*

## HAMMERS, ELECTRIC OR PNEUMATIC

*(For closing Pittsburgh locks)*

*See Tools, Metal Workers*

## HANGERS

*See Fittings and Accessories, Eaves Trough and Gutter*

## HARDWARE, FOR CABINETS AND CASINGS

*(Handles, name plates, etc.)*

- American Cabinet Hardware Corp., Rockford, Ill. (Pulls, Knobs, Hinges, Catches, etc.)
- American Emblem Co., Utica, N. Y. (name plates)
- American Insulator Corp., New Freedom, Pa.
- Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.
- Brasco Manufacturing Co., Harvey, Ill.
- Crowe Name Plate & Mfg. Co., Chicago.
- Dickey-Grabler Co., Cleveland (name plate)
- Etched Products Co., Long Island City, N. Y. (name plates)
- General Etching & Mfg. Co., Chicago (name plates)
- Grammes, L. F., & Sons, Inc., Allentown, Pa.
- Imperial Molded Products Corp., Chicago (Plastic handles, pulls and knobs)
- Mason & Sons, F. E., Batavia, N. Y. (name plates)
- Metal Marker Co., Cleveland. (name plates)
- National Lock Co., Rockford, Ill.
- Premier Metal Etching Co., Long Island City (name plates)
- Soss Manufacturing Co., Detroit, Mich. (Invisible Hinges)
- Stafford Co., N., Brooklyn, N. Y. (name plates)
- Stanley Mfg. Co., Dayton, O. (name plates)

## HEADS

*See Fittings and Accessories, Conductor*

## HEAT TRANSFER SURFACE

*See Coils, Cooling, Direct Expansion; Coils, Heating; Coils, Cooling, Water*

## HEATERS, CIRCULATING, CABINET TYPE

- Acme Tin Plate & Roofing Supply Co., Philadelphia. (Electric)
- American Stove Company, Lorain Div., Lorain, Ohio. (Oil)
- Andrews Heating Co., Minneapolis. (Coal and Oil)
- Auburn Burner Co., Auburn, Ind. (Oil)
- Cole Hot Blast Manufacturing Co., Chicago. (Coal, Oil, Gas, Wood)
- Continental Stove Corp., Ironton, O. (Gas)
- Dallman Supply Co., Sacramento, Cal. (Gas)
- Day & Night Manufacturing Co., Monrovia, Cal. (Gas)

- Duo-Therm Division, Motor Wheel Corporation, Lansing, Mich.
- Edwards Manufacturing Co., Inc., Cincinnati (Coal, Coke, Wood)
- Estate Stove Co., Hamilton, O.
- Evanoil Heater Div., Evans Products Co., Detroit. (Oil & Gas)
- Florence Stove Co., Garner, Mass. (Oil)
- Globe Machine & Stamping Co., Cleveland. (Oil)
- Heating Equipment Co., San Francisco. (Gas)
- Independence Stove & Furnace Co., Independence, Mo. (Gas or Coal)
- Iron Fireman Manufacturing Co., Cleveland. (Coal, Stoker)
- Kleen-Heat, Inc., Chicago. (Oil)
- Laco Oil Burner Co., Griswold, Ia. (Oil)
- Little Burner Co., Inc., H. C., San Rafael, Cal. (Oil)
- Loneragan Manufacturing Co., Albion, Mich.
- Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill. (Coal, Gas, Oil and Wood)
- Moore Corporation, Joliet, Ill.
- Ohio Foundry & Mfg. Co., Steubenville, O.
- Pacific Gas Radiator Co., Huntington Park, Cal.
- Palmer Mfg. Corp., Phoenix, Ariz. (Gas)
- Patten Co., J. V., Sycamore, Ill. (Coal, Oil and Gas).
- Payne Furnace & Supply Co., Beverly Hills, Cal.
- Perfection Stove Co., Cleveland. (Oil)
- Pernot & Rich, Inc., Los Angeles.
- Pittston Stove Co., Pittston, Pa. (Coal or Wood)
- Quaker Mfg. Co., Chicago, Ill. (Oil)
- Quincy Stove Mfg. Co., Quincy, Ill. (Oil and Coal)
- Reznor Mfg. Co., Mercer, Pa. (Gas)
- Royal Air Conditioning Equip. Co., Alhambra, Cal.
- Schoedinger, F. O., Columbus, Ohio.
- Shreveport Engineering Co., Inc., Shreveport, La.
- Silent Glow Oil Burner Corp., Hartford, Conn. (Range Oil)
- Silent Sioux Oil Burner Corp., Orange City, Ia. (Oil)
- Surface Combustion Corp., Toledo, O. (Gas)
- Tennessee Enamel Mfg. Co., Nashville, Tenn. (Gas)
- Utility Fan Corporation, Los Angeles. (Gas, Butane)
- Vacuum Gas Appliance Div., Union Fork & Hoe Co., Rome, N. Y. (Gas)
- Victor Oil Burner Mfg. Co., Hartford, Conn.
- Viking Mfg. Corp., Dayton, Ohio. (Oil)

## HEATERS, SCHOOL ROOM

- Agricola Furnace Co., Inc., Gadsden, Ala.
- American Foundry & Furnace Co., Bloomington, Ill.
- American Furnace & Foundry Co., Milan, Mich.
- American Radiator and Standard Sanitary Corp., Pittsburgh.
- Andrews Heating Co., Minneapolis.
- Barry Furnace Co., Hamilton, O.
- Brillion Furnace Co., Brillion, Wis.
- Campbell Heating Co., Des Moines, Ia.
- Chandler Co., Cedar Rapids, Ia.
- Daniels Mfg. Co., Inc., Sam, Hartwick, Vermont. (Wood)
- Danville Stove & Mfg. Co., Danville, Pa.
- Dowagiac Steel Furnace Co., Dowagiac, Mich.
- Excelsior Stove & Mfg. Co., Quincy, Ill.
- Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
- Green Colonial Furnace Co., Des Moines, Ia.
- Hart & Crouse Corporation, Utica, N. Y.
- Hart Mfg. Co., Louisville, Ky. (Coal and Gas)
- Heating Equipment Co., San Francisco. (Gas)
- Henry Furnace & Foundry Co., Cleveland, O.
- Hess-Snyder Co., Massillon, Ohio.
- Home Stove Co., Indianapolis, Ind.
- Homer Furnace & Foundry Corp., Coldwater, Mich.
- International Heater Co., Utica, N. Y.
- Keith Furnace Co., Des Moines, Ia.
- Kelsey Heating Co., Syracuse, N. Y.
- Koons Furnace Co., Danville, Ill.
- Lennox Furnace Co., Marshalltown, Ia.
- Little Burner Co., Inc., H. C., San Rafael, Cal. (Oil)
- MaGirl Foundry and Furnace Works, P. H., Bloomington, Ill.
- McLouth Air Conditioning Corp., Lansing, Mich.
- Maple City Furnace Co., Monmouth, Ill.
- Marshall Furnace Co., Marshall, Mich.
- May-Flebeiger Co., Newark, Ohio.
- Meyer Furnace Co., Peoria, Ill.
- Moncrief Furnace Co., Atlanta, Ga.
- Moore Corp., Joliet, Ill.
- Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- National Manufacturing & Engineering Co., Detroit.
- Nesbitt, Inc., John J., Philadelphia.
- Ohio Foundry and Manufacturing Co., Steubenville, O.
- Orbon Stove Co., Belleville, Ill.
- Patten Co., J. V., Sycamore, Ill. (Coal Oil and Gas)
- Payne Furnace & Supply Co., Beverly Hills, Cal.
- Perfection Stove Co., Cleveland. (Oil)
- Pittston Stove Co., Pittston, Pa.
- Portland Stove Foundry Co., Portland, Me.
- Premier Furnace Co., Dowagiac, Mich.
- Quaker Mfg. Co., Chicago.
- Reynolds Manufacturing Co., Springfield, Mo.
- Reznor Mfg. Co., Mercer, Pa.
- Rock Island Stove Co., Rock Island, Ill.
- Round Oak Co., Dowagiac, Mich.
- Royal Air Conditioning Equip. Co., Alhambra, Cal.

•Advertisement in this issue. See Index to Advertisers, page 310

Rudy Furnace Co., Dowagiac, Mich.  
 St. Clair Foundry Corp., Centralia, Ill.  
 Sioux City Foundry and Boiler Co., Sioux City, Ia.  
 Tennessee Enamel Mfg. Co., Nashville, Tenn. (Gas)  
 Twentieth Century Heating & Ventilating Co., Akron, O.  
 Vacuum Gas Appliance Div., Union Fork & Hoe Co., Rome, N. Y.

- Waterman-Waterbury Co., Minneapolis, Minn.
- Western Blower Co., Seattle, Wash.
- Williamson Heater Co., Cincinnati, O.
- Wise Furnace Co., Akron, O.
- XXth Century Heating & Ventilating Co., Akron, O.

### HEATING COILS

*See Coils, Heating*

### HEATERS, WATER, OIL-FIRED

- Airtemp Division, Chrysler Corporation, Dayton, Ohio.  
 Aldrich Company, Wyoming, Ill.  
 ● Automatic Humidifier Co., Cedar Falls, Iowa.  
 Century Engineering Corporation, Cedar Rapids, Iowa.  
 ● Chandler Company, Cedar Rapids, Ia.  
 Cleveland Steel Products Corporation, Toridheet Div., Cleveland.  
 Delco Appliance Div., General Motors Sales Corp., Rochester, N. Y.  
 Duo-Therm Div., Motor Wheel Corporation, Lansing, Mich.  
 Electrol Incorporated, Clifton, N. J.  
 Essick Manufacturing Company, Los Angeles, Cal.  
 Florence Stove Co., Gardner, Mass.  
 Gerstein & Cooper Co., South Boston, Mass.  
 ● Gillen Company, J. L., Dowagiac, Mich.  
 Johnson Co., S. T., Oakland, Cal.  
 ● Lochinvar Products, Division of Michigan Tank & Furnace Corp., Dearborn, Mich.  
 ● Michigan Tank & Furnace Corp., Detroit.  
 National Airoil Burner Co., Inc., Philadelphia.  
 Nu-Way Corp., Rock Island, Ill.  
 Ohio Foundry & Mfg. Co., Steubenville, Ohio.  
 Penn. Boiler & Burner Mfg. Corp., Lancaster, Pa.  
 Perfection Stove Co., Inc., Cleveland.  
 Petroleum Heat & Power Co., Stamford, Conn.  
 Progressive Co., Chicago, Ill.  
 Quaker Manufacturing Co., Chicago.  
 ● Quincy Stove Mfg. Co., Quincy, Ill.  
 Ray Oil Burner Company, San Francisco.  
 Scott-Newcomb, Inc., St. Louis.  
 Standard Heater & Oil Equipment Co., Jersey City, N. J.  
 Taco Heaters, Inc., New York City.  
 Viking Mfg. Corp., Dayton, Ohio.  
 Wayne Oil Burner Corporation, Fort Wayne, Ind.  
 Williams Oil-O-Matic Heating Corp., Bloomington, Ill.  
 York Oil Burner Company, Inc., York, Pa.

### HEATERS, WATER, STOKER-FIRED

- Illinois Iron & Bolt Co., Chicago.  
 ● Schwitzer-Cummins Company, Indianapolis, Ind.  
 Standard Heater & Oil Equipment Co., Jersey City, N. J.

### HOSE, METAL, FOR ELIMINATING COMPRESSOR VIBRATION

- American Metal Hose Branch, American Brass Co., Waterbury, Conn.  
 Atlantic Metal Hose Co., Inc., New York City.  
 Chicago Metal Hose Corporation, Maywood, Ill.  
 Conklin Brass & Copper Co., Inc., T. E., New York City.  
 Eclipse Aviation, Div. Bendix Aviation Corp., Bendix, N. J.  
 Packless Metal Products Corp., New Rochelle, N. Y.  
 Pennsylvania Flexible Metallic Tubing Co., Philadelphia.  
 Seamlex Co., Long Island City, N. Y.  
 Titeflex Metal Hose Co., Newark, N. J.  
 United Metal Hose Co., Inc., Long Island City, N. Y.

### HOUSINGS, BLOWER

- Air Controls, Inc., Cleveland, O.  
 ● Brundage Co., Kalamazoo, Mich.  
 ● Clarage Fan Co., Kalamazoo, Mich.  
 Commercial Shearing & Stamping Co., Youngstown, Ohio.  
 Dahlstrom Metallic Door Co., Jamestown, N. Y.  
 Detroit Stamping Co., Detroit.  
 Economy Electric Mfg. Co., Cicero, Ill.  
 General Blower Corp., San Francisco.  
 Hastings Air Conditioning Co., Inc., Hastings, Nebr.  
 ● Lau Blower Co., Dayton, Ohio.  
 National Manufacturing & Engineering Co., Detroit.  
 Sandberg Co., H. J., Portland, Ore.  
 ● Schwitzer-Cummins Co., Indianapolis, Ind.  
 ● Sturtevant Co., B. F., Hyde Park, Boston.  
 ● U. S. Air Conditioning Corp., Minneapolis.  
 Viking Air Conditioning Corp., Cleveland.

### HOUSINGS, FAN, PROPELLER

- Commercial Shearing & Stamping Co., Youngstown, Ohio.  
 (Venturi type)  
 Dahlstrom Metallic Door Co., Jamestown, N. Y.

### HUMIDIFIER FITTINGS

*See Fittings, Humidifier, Water Line*

### HUMIDIFIER VALVES

*See Valves, Humidifier, Water Level*

### HUMIDIFIERS, FURNACE, EVAPORATION, AUTOMATIC

- Agricola Furnace Co., Inc., Gadsden, Ala.  
 American Air Conditioning Co., Minneapolis, Minn.  
 American Furnace & Foundry Co., Milan, Mich.  
 American Humidifier Corp., Grand Rapids, Mich.  
 ● Automatic Humidifier Co., Cedar Falls, Ia.  
 Badger Mfg. & Sales Co., Milwaukee.  
 Barclay, Inc., Robert, Chicago.  
 ● Bard Manufacturing Company, Bryan, Ohio.  
 Betz Air Conditioning Corp., Kansas City, Mo.  
 Cary Mfg. Co., Waupaca, Wis.  
 ● Chandler Co., Cedar Rapids, Ia.  
 Comfort Products Corporation, Harvey, Ill.  
 Gardner Manufacturing Co., Horicon, Wis.  
 Glasby Manufacturing Company, Inc., J. P., Bloomfield, N. J.  
 Green Colonial Furnace Co., Des Moines, Ia.  
 ● Hall-Neal Furnace Co., Indianapolis, Ind.  
 ● Henry Furnace & Foundry Co., Cleveland, O.  
 Home Furnace Co., Holland, Mich.  
 Ideal Furnace Co., Detroit, Mich.  
 Iowa Foundry Co., Sioux City, Ia.  
 ● Johnson Gas Appliance Co., Cedar Rapids, Ia.  
 Kraker, Henry, Holland, Mich.  
 Lennox Furnace Co., Marshalltown, Iowa.  
 ● Little Burner Co., Inc., H. C., San Rafael, Cal.  
 ● McDonnell & Miller, Chicago.  
 ● Maid-O'-Mist, Inc., Chicago, Ill.  
 Marshall Furnace Co., Marshall, Mich.  
 ● Mayflower Air-Conditioners, Inc., St. Paul.  
 ● Meyer Furnace Co., Peoria, Ill.  
 ModernAire Co. Div. Des Moines Stove Repair Co., Des Moines, Ia.  
 ● Monmouth Products Co., Cleveland, O.  
 ● Mueller Furnace Co., L. J., Milwaukee, Wis.  
 Nugent Furnaces, Thomas, New York City.  
 ● Olsen Manufacturing Co., C. A., Elyria, Ohio.  
 ● Patten Co., J. V., Sycamore, Ill.  
 Pennsylvania Furnace & Iron Co., Warren, Pa.  
 Pfening Co., Fred D., Columbus, Ohio.  
 ● Premier Furnace Co., Dowagiac, Mich.  
 Roberts-Hamilton Co., Minneapolis, Minn.  
 Rockford Brass Works, Rockford, Ill.  
 ● Round Oak Co., Dowagiac, Mich.  
 Rudy Furnace Co., Dowagiac, Mich.  
 Russell & Company, W. A., Bridgeport, Conn.  
 Scoville Manufacturing Co., Morency - Van Buren Div., Sturgis, Mich.  
 Security Manufacturing Co., Kansas City, Mo.  
 Sioux City Foundry and Boiler Co., Sioux City, Ia.  
 Skilbeck Mfg. Co., Kenosha, Wis.  
 ● Skuttle Sales Co., Detroit.  
 Somers, Inc., H. J., Detroit, Mich.  
 Thatcher Furnace Co., Newark, N. J.  
 Universal Blower Co., Birmingham, Mich.  
 Viking Air Conditioning Corp., Cleveland, O.  
 Western Blower Co., Seattle, Wash.  
 Westinghouse Electric & Mfg. Co., Springfield, Mass.  
 ● Wise Furnace Co., Akron, O.

### HUMIDIFIERS, FURNACE, SPRAY, AUTOMATIC

- Air Controls, Inc., Cleveland, O.  
 American Foundry & Furnace Co., Bloomington, Ill.  
 ● American Radiator and Standard Sanitary Corp., Pittsburgh.  
 Binks Mfg. Co., Chicago, Ill.  
 Bishop & Babcock Mfg. Co., Cleveland, O.  
 Chelsea Fan & Blower Co., Inc., Irvington, N. J.  
 Electric Sprayit Company, Sheboygan, Wis.  
 Handelan Washed Air Co., Minneapolis, Minn.  
 Hubbard Company, Minneapolis.  
 McLouth Air Conditioning Corp., Lansing, Mich.  
 Marshall Furnace Co., Marshall, Mich.  
 ● Mayflower Air-Conditioners, Inc., St. Paul.  
 ● Meyer Furnace Co., Peoria, Ill.  
 Rega Mfg. Co., Rochester, N. Y.  
 Somers, Inc., H. J., Detroit, Mich.  
 Southworth Machine Co., Portland, Me.  
 Spray Engineering Co., Somerville, Mass.  
 Spraying Systems Company, Chicago.  
 Supreme Electric Products Corp., Rochester, N. Y.  
 Thatcher Furnace Co., Newark, N. J.  
 United American Bosch Corp., Springfield, Mass.

### HUMIDIFIERS, UNIT, ROOM TYPE (Without Heating)

- Alter Co., Harry, Chicago.  
 Carrier Corp., Syracuse, N. Y.  
 Certified Products Co., Toledo, Ohio.  
 Coolmaster Corp., Chicago.  
 Fairbanks, Morse & Co., Chicago.  
 Handelan Washed Air Co., Minneapolis.  
 Hotstream Heater Co., Cleveland.  
 Hugo Mfg. Co., Duluth, Minn.  
 Kauffman Air Conditioning Corp., St. Louis.  
 Lion Mfg. Corp., Chicago.

● Advertisement in this issue. See Index to Advertisers, page 310



- Little Giant Vaporizer Co., Oklahoma City, Okla. (Vaporizer)  
 Lohman, Inc., Wm. J., Irvington, N. J.  
 Lowell Air Conditioning Corp., Philadelphia.  
 • Marley Company, Kansas City, Kansas.  
 Norwood Filtration Co., The, Florence, Mass.  
 Skilbeck Mfg. Co., Kenosha, Wis.  
 Somers, Inc., H. J., Detroit.  
 Southworth Machine Co., Portland, Me.  
 Spray-Wheel Air Conditioners, Inc., Denver, Colo.  
 Standard Engineering Works, Pawtucket, R. I.  
 Steamair Co., Cincinnati, Ohio.  
 • U. S. Air Conditioning Corp., Minneapolis, Minn.  
 Vigor-Aire Corp., Philadelphia.

### HUMIDISTATS

- American Moistening Co., Providence, R. I.  
 Au-Temp-Co Corp., New York City.  
 Bahnson Co., Winston-Salem, N. C.  
 Barber-Colman Co., Rockford, Ill.  
 Bristol Co., Waterbury, Conn.  
 • Detroit Lubricator Co., Detroit, Mich.  
 Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore. (Human hair)  
 H-B Instrument Co., Inc., Philadelphia, Pa.  
 Johnson Service Co., Milwaukee, Wis. (Wood, Hair, Membrane)  
 • Minneapolis-Honeywell Regulator Co., Minneapolis, Minn. (Human hair)  
 Parks-Cramer Co., Fitchburg, Mass.  
 • Penn Electric Switch Co., Goshen, Ind.  
 Powers Regulator Co., Chicago.  
 Spencer Thermostat Co., Attleboro, Mass.  
 Standard Engineering Works, Pawtucket, R. I.  
 Tagliabue Mfg. Co., C. J., Brooklyn.  
 Taylor Instrument Companies, Rochester, N. Y.  
 • White-Rodgers Electric Co., St. Louis.

### HUMIDITY CONTROLS

*See Humidistats*

### HUMIDITY RECORDERS

*See Recorders, Humidity*

### HYGROMETERS

- American Moistening Co., Providence, R. I.  
 American Schaeffer & Bundenberg Instrument Div., Manning, Maxwell & Moore, Inc., Bridgeport, Conn.  
 Bahnson Co., Winston-Salem, N. C.  
 Bristol Co., Waterbury, Conn.  
 Brown Instrument Co., Div. of Minneapolis-Honeywell Regulator Co., Philadelphia, Pa.  
 Fee and Stenwedel, Inc., Chicago.  
 Foxboro Co., Foxboro, Mass.  
 Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.  
 G. M. Manufacturing Co., New York City.  
 H. B. Instrument Co., Inc., Philadelphia.  
 Hill Co., E. Vernon, Chicago.  
 International Moistening Co., Providence, R. I.  
 Johnson Service Co., Milwaukee, Wis.  
 Moeller Instrument Co., Richmond Hill, New York City.  
 Palmer Co., Cincinnati.  
 Parks-Cramer Co., Fitchburg, Mass.  
 Precision Thermometer and Instrument Co., Philadelphia.  
 Rochester Mfg. Co., Rochester, N. Y.  
 Scientific Instrument Co., Detroit.  
 Standard Thermometer, Inc., Boston.  
 Tagliabue Mfg. Co., C. J., Brooklyn.  
 Taylor Instrument Companies, Rochester, N. Y.  
 Terlice Co., H. O., Detroit.  
 Weksler Thermometer Corp., New York City.

### INDICATORS, SOUND LEVEL

- General Electric Co., Schenectady, N. Y.

### INSULATING CEMENT

*See Cement, Insulating*

### INSULATING WINDOWS, HEAT

*See Windows, Heat Insulating*

### INSULATION, BUILDING

- Acme Asbestos Covering & Flooring Co., Chicago, Ill. (Rockwool)  
 Air-O-Cell Industries, Inc., Detroit.  
 Alfol Insulation Co., Inc., New York City. (Blanket)  
 Alton Mineral Wool Insulation Co., Alton, Ill.  
 Aluminum Aircell Insulation Co., Detroit.  
 Aluminum Company of America, Pittsburgh. (Reflective)  
 American Flange & Mfg. Co., Inc., New York City. (Metal Sheets)  
 American Hair & Felt Co., Chicago. (Hair felt)  
 Armstrong Cork Co., Lancaster, Pa. (Cork)  
 Bache & Co., Semon, New York City. (Glass)  
 Baldwin-Hill Co., Trenton, N. J. (Rockwool)  
 Barrett Division, Allied Chemical & Die Corporation, New York City. (Tar felt and rockwool)  
 Berry Jr. & Co., Inc., F. E., Everett, Mass.  
 • Blocksom & Company, Michigan City, Ind.

- Cabot, Inc., Samuel, Boston, Mass.  
 Carey Co., Philip, Lockland, Cincinnati, O. (Rock wool)  
 Carney Rockwool Co., Mankato, Minn. (Granulated and Batt)

- Celotex Corp., Chicago, Ill.  
 Chamberlin Metal Weather Strip Co., Detroit. (Rock wool)  
 Coast Insulating Corp., Los Angeles. (Rockwool Batts, Fill)

- Cork Import Corp., New York City. (Corkboard)  
 Cork Insulation Co., New York City. (Cork)

- Doherty Co., John J., Belmont, Mass. (Blanket)

- Dry-Zero Corporation, Chicago. (Blanket and Bound Batt)

- Eagle Picher Lead Co., Cincinnati, O. (Mineral wool)

- Ehret Magnesia Mfg. Co., Valley Forge, Pa.

- Flir-Tex Insulating Board Co., St. Helena, Ore. (Wood fibreboard)

- Flintkote Co., New York City. (Fibre board and rockwool)

- Ford Roofing Products Co., Chicago. (Board and rockwool)

- General Insulating Products Co., Brooklyn, N. Y.

- Grant Wilson, Inc., Chicago (Rock Wool)

- Hinde & Dauch Paper Co., Sandusky, O. (Air-Cell)

- Insul-Wool Insulation Corp., Wichita, Kansas.

- Insulite Div. Minnesota and Ontario Paper Co., Minneapolis, Minn. (Wood fibre)

- International Vermiculite Co., Springfield, Ill. (Loose fill)

- Jiffy Manufacturing Co., Hillside, N. J. (Blanket)

- Johns-Manville, New York City. (Rock wool, fibre board)

- Johnston Tin Foil & Metal Co., St. Louis. (Paper backed foil)

- Keasbey Co., Robert A., New York City. (Rock wool)

- Kennedy, Inc., David E., Brooklyn, N. Y. (Board)

- Kimberly-Clark Corp., Chicago. (Expanding Blanket)

- Marblehead Lime Co., Chicago. (Rock wool)

- Masonite Corp., Chicago, Ill. (Sheathing, Lath, Tile, Plank, Blanket, Finish Panels)

- Mineral Insulation Co., Chicago Ridge, Ill. (Rock wool)

- Mitchell & Smith, Inc., Detroit. (Cork)

- Multi-Cell Sales Corp., Minneapolis. (Used Newspaper Quilted)

- Mundet Cork Corp., Brooklyn, N. Y. (Cork)

- National Gypsum Co., Buffalo, N. Y.

- Pacific Lumber Co., San Francisco, Cal. (Loose fill)

- Pacific States Felt & Mfg. Co., Inc., San Francisco, Cal.

- Plasteron Wall Board Co., Buffalo. (Mineral Wool and Rigid Board)

- Poe Co., C. W., Cleveland. (Mineral Wool)

- Refractory & Insulation Corp., New York City. (Mineral wool, loose granulated)

- Reynolds Metals Co., Inc., Richmond, Va. (Reflective)

- Riverton Lime & Stone Co., Inc., Riverton, Va. (Mineral Wool)

- Robinson Insulation Co., Great Falls, Mont. (Loose Fill)

- Rock Fleece Co., El Paso, Texas. (Fill)

- Rock Wool Products Co., Inc., Wabash, Ind. (Loose fill)

- Ruberoid Co., New York City. (Rock wool)

- Samson Plaster Board Co., Buffalo. (Fill, bats, blankets, foil, board)

- Seneca Rock Wool Co., Tiffin, Ohio. (Fill)

- Silvercote Products, Inc., Chicago. (Reflective fabric)

- Specialty Converters, Inc., East Braintree, Mass. (Reflective)

- Sprayo-Flake Co., Chicago, Ill.

- Standard Asbestos Mfg. Co., Chicago, Ill. (Asbestos, hair-felt)

- Standard Lime & Stone Co., Baltimore, Md. (Rock wool)

- Standard Rolling Mills Incorporated, Brooklyn. (Reflective)

- Tennessee Products Corp., Nashville, Tenn. (Mineral Wool)

- Therminsul Corp. of America, Kalamazoo, Mich. (Bats, bulk, granulated)

- Truscon Steel Co., Youngstown, O. (Board between metal sheets)

- Union Rock Wool Corp., Wabash, Ind. (all types)

- United Cork Companies, Kearney, N. J.

- United States Gypsum Co., Chicago, Ill. (Wool and board)

- United States Mineral Wool Co., Chicago. (Rock wool)

- U. S. Rock Wool Co., Salt Lake City (Granulated, Batt and Blanket)

- Universal Gypsum & Lime Co., Chicago. (Loose fill)

- Universal Zonolite Insulation Co., Chicago. (Loose Fill, Plaster)

- Upson Co., Lockport, N. Y. (Board)

- Waukesha Lime & Stone Co., Waukesha, Wis. (Rock Wool bats and bulk)

- Western Mineral Products Co., Omaha, Nebr. (Fill)

- Western Rock Wool Corp., Huntington, Ind. (Fill)

- Wilson & Co., Inc., Chicago, Ill. (Flexible, Blanket, Board)

- Wilson, Inc., Grant, Chicago, Ill. (Rock Wool)

- Wood Conversion Co., St. Paul, Minn. (Board and blanket)

### INSULATION, DUCT, SOUND DEADENING

- American Hair & Felt Co., Chicago, Ill.  
 Baldwin-Hill Company, Trenton, N. J. (Rockwool, block)  
 Barrett Division, Allied Chemical & Die Corporation, New York City.

- Berry, Jr. & Co., Inc., F. E., Everett, Mass.

- Cabot, Inc., Samuel, Boston, Mass.

- Carey Co., Philip, Cincinnati, O.

- Celotex Corp., Chicago, Ill.

- Cellulose Products Div., Masonite Corp., Chicago.

- Ehret Magnesia Mfg. Co., Valley Forge, Pa.  
 Felters Co., Inc., Boston, Mass.  
 ● Grant Wilson, Inc., Chicago.  
 Insulite Div. Minnesota and Ontario Paper Co., Minneapolis.  
 Johns-Manville, New York City.  
 Kimberly-Clark Corp., Chicago, Ill.  
 Maxim Silencer Co., Hartford, Conn.  
 Mortell Co., J. W., Kankakee, Ill. (Adhesive)  
 Nelson Mfg. Co., B. F., Minneapolis, Minn.  
 Owens-Corning Fiberglas Corporation, Toledo.  
 Pacific States Felt & Mfg. Co., Inc., San Francisco.  
 Plant Rubber & Asbestos Works, San Francisco.  
 Poe Co., C. W., Cleveland.  
 Robinson Insulation Co., Great Falls, Mont.  
 Reynolds Metals Co., Inc., Richmond, Va.  
 Seneca Rock Wool Co., Tiffin, Ohio.  
 Telsit Insulation Co., Bronx, N. Y. (Plastic)  
 Universal Zonolite Insulation Co., Chicago. (Cement)  
 Western Felt Works, Chicago, Ill.  
 Western Silicair Products, Inc., Burbank, Cal.  
 ● Wilson, Inc., Grant, Chicago, Ill.

### INSULATION, DUCT, THERMAL

- Acme Asbestos Covering & Flooring Co., Chicago, Ill.  
 Air-O-Cel Industries, Inc., Detroit.  
 Alfol Insulation Co., Inc., New York City. (Aluminum foil)  
 American Flange & Mfg. Co., Inc., New York City.  
 American Hair & Felt Co., Chicago, Ill.  
 Armstrong Cork Co., Lancaster, Pa.  
 Baldwin-Hill Co., Trenton, N. J. (Blanket)  
 Barrett Division, Allied Chemical & Die Corporation, New York City.  
 Berry Jr. & Co., Inc., F. E., Everett, Mass.  
 Cabot, Inc., Samuel, Boston, Mass.  
 Carey Co. Philip, Cincinnati, O.  
 Celotex Corp., Chicago, Ill.  
 Cellufoam Products Div., Masonite Corp., Chicago.  
 Cork Import Corp., New York City. (Corkboard)  
 Cork Insulation Co., Inc., New York City. (Cork)  
 Dry-Zero Corporation, Chicago.  
 Eagle-Picher Lead Co., Cincinnati, O. (Mineral wool, block, blanket)  
 Ehret Magnesia Mfg. Co., Valley Forge, Pa.  
 Felters Co., Inc., Boston.  
 Fir-Tex Insulating Board Co., St. Helens, Ore.  
 General Insulating Products Co., Brooklyn.  
 ● Grant Wilson, Inc., Chicago.  
 Insulite Div. Minnesota and Ontario Paper Co., Minneapolis.  
 International Vermiculite Co., Springfield, Ill. (Block)  
 Johns-Manville, New York City.  
 Keasbey Co., Robert A., New York City.  
 Keasbey & Mattison Co., Ambler, Pa. (Asbestos air cell)  
 Kennedy, Inc., David E., Brooklyn, N. Y. (Cork)  
 Keystone Asphalt Products Co., Chicago.  
 Kimberly-Clark Corp., Chicago. (Expanding Blanket)  
 Miller Rubber Company, Inc., Akron, Ohio. (Sponge Rubber)  
 Mineral Insulation Co., Chicago Ridge, Ill. (Rock wool)  
 Mitchell & Smith, Inc., Detroit.  
 Mundet Cork Corp., Brooklyn, N. Y. (Cork)  
 Munn and Steele, Inc., Newark, N. J.  
 National Gypsum Co., Buffalo, N. Y.  
 Nelson Mfg. Co., B. F., Minneapolis.  
 Norristown Magnesia & Asbestos Co., Norristown, Pa.  
 Owens-Corning Fiberglas Corp., Toledo, Ohio.  
 Pacific States Felt & Mfg. Co., Inc., San Francisco, Cal.  
 Plant Rubber & Asbestos Works, San Francisco.  
 Quigley Company, Inc., New York City.  
 Refractory & Insulation Corp., New York City. (Inside Duct Lining)  
 Reynolds Metals Co., Inc., Richmond, Va.  
 Robinson Insulation Co., Great Falls, Mont.  
 Rock Wool Products Co., Inc., Wabash, Ind.  
 Ruberoid Co., New York City. (Cellular)  
 ● Sall Mountain Co., Chicago, Ill.  
 Schundler & Co., Inc., F. E., Joliet, Ill.  
 Smith & Kanzler Corp., Elizabeth, N. J.  
 Sprayo-Flake Co., Chicago, Ill.  
 Standard Asbestos Mfg. Co., Chicago, Ill.  
 Telsit Insulation Co., Bronx, N. Y.  
 Therminul Corp., Kalamazoo, Mich. (Block rock wool)  
 United Cork Companies, Kearney, N. J.  
 United States Mineral Wool Co., Chicago. (Rockwool)  
 Universal Zonolite Insulation Co., Chicago. (Cement and Blocks)  
 Western Felt Works, Chicago, Ill.  
 Wilson & Co., Inc., Chicago, Ill. (Flexible, fire resisting)  
 ● Wilson, Inc., Grant, Chicago, Ill.  
 Wood Conversion Co., St. Paul, Minn.

### INSULATION, FURNACE

- Acme Asbestos Covering & Flooring Co., Chicago.  
 Alfol Insulation Co., Inc., New York City.  
 Aluminum Aircell Insulation Co., Detroit. (Asbestos)  
 Baldwin-Hill Co., Trenton, N. J. (Asbestos cement)  
 Carey Co., Philip, Cincinnati, O.  
 Coast Insulating Corp., Los Angeles. (Rock Wool Cement)  
 Eagle Picher Lead Co., Cincinnati, O. (Blocks)  
 Ehret Magnesia Mfg. Co., Valley Forge, Pa.  
 ● Grant Wilson, Inc., Chicago.

- Green Fire Brick Company, A. P., Mexico, Mo. (Vermiculite)  
 International Vermiculite Co., Springfield, Ill. (Block-Cement)  
 Johns-Manville, New York City.  
 Keasbey Co., Robert A., New York City (Asbestos)  
 Keasbey & Mattison Co., Ambler, Pa.  
 Krehbiel Co., J. H., Chicago. (Boiler and Breech Covering)  
 Mineral Insulation Co., Chicago Ridge, Ill. (Rock wool)  
 Munn and Steele, Inc., Newark, N. J.  
 Norristown Magnesia & Asbestos Co., Norristown, Pa.  
 Owens-Corning Fiberglas Corp., Toledo, O. (Blanket)  
 Pacific States Felt & Mfg. Co., Inc., San Francisco, Cal.  
 Quigley Company, Inc., New York City  
 Refractory & Insulation Corp., New York City. (Block, Blanket)  
 Robinson Insulation Co., Great Falls, Mont. (High Temperature Cement)  
 Rock Wool Products Co., Inc., Wabash, Ind. (Rock wool)  
 Ruberoid Co., New York City. (Blocks, Asbestos Cement)  
 Schundler & Co., Inc., F. E., Joliet, Ill.  
 Smidth & Co., F. L., New York City.  
 Smith & Kanzler Corp., Elizabeth, N. J.  
 Standard Asbestos Mfg. Co., Chicago, Ill.  
 Standard Lime & Stone Co., Baltimore. (Blankets, Cement)  
 Telsit Insulation Co., Bronx, N. Y.  
 Therminul Corp., Kalamazoo, Mich. (Block rock wool.)  
 United States Mineral Wool Co., Chicago.  
 Universal Zonolite Insulation Co., Chicago. (Cement, Bricks and blocks)  
 ● Wilson, Inc., Grant, Chicago, Ill.

### KITCHEN FANS

*See Fans, Kitchen*

### LACQUERS

*See Enamels and Lacquers*

### LEADER STRAPS

*See Fittings and Accessories, Conductor*

### LIFTS, SKYLIGHT

- Biersach & Niedermeyer Company, Milwaukee.  
 California Cornice, Steel & Supply Corp., Los Angeles.  
 ● Cincinnati Sheet Metal & Roofing Co., Cincinnati.  
 Dayton Greenhouse Mfg. Co., Dayton, O.  
 ● Levow, David, New York City. (Gearing)  
 Main Cornice Works, Los Angeles, Cal.  
 Park City Cornice Works, Inc., Bridgeport, Conn.  
 Royal-Apex Mfg. Corp., Brooklyn, N. Y.  
 Schoedinger, F. O., Co., Columbus, O.  
 Sheet Metal Mfg. Co., Inc., Brooklyn.  
 Van Noorden Co., E., Boston, Mass.  
 Weiss & Co., H., New York City.  
 ● Willis Steel Corporation, Galesburg, Ill.

### LIGHTERS, FURNACE FIRE

American Furnace Lighter Sales Co., St. Louis.

### LOUVRES AND SHUTTERS, AUTOMATICALLY OR MANUALLY CONTROLLED

- Air Control Products, Inc., Coopersville, Mich.  
 Air Controls, Inc., Cleveland.  
 Air Conditioning Products Co., Detroit, Mich.  
 Airecon Industries Incorporated, Detroit.  
 Airmaster Corp., Chicago, Ill.  
 ● Allen Corp., Detroit, Mich.  
 American Blower Corp., Detroit, Mich.  
 American Coolair Corp., Jacksonville, Fla.  
 American Foundry & Furnace Co., Bloomington, Ill.  
 American Warming & Ventilating Co., Toledo, O.  
 Ames Co., W. R., San Francisco, Cal.  
 Arex Co., Chicago, Ill.  
 Autovent Fan & Blower Div., Herman Nelson Corporation, Chicago.  
 Barber-Colman Company, Rockford, Ill.  
 Belco Exhaust Fan Mfg. Co., St. Louis.  
 Bishop & Babcock Mfg. Co., Cleveland, O.  
 Buffalo Forge Co., Buffalo, N. Y.  
 Burt Mfg. Co., Akron, O.  
 California Cornice, Steel & Supply Corp., Los Angeles.  
 Campbell Heating Co., E. K., Kansas City, Mo.  
 Champion Blower & Forge Co., Lancaster, Pa.  
 Chelsea Fan & Blower Co., Inc., Irvington, N. J.  
 Chicago Metal Mfg. Co., Chicago, Ill.  
 Circulators & Devices Mfg. Corp., New York City.  
 Clay Equipment Corp., Cedar Falls, Ia.  
 Dual-Air Fan Corporation, Chicago.  
 Economy Electric Manufacturing Co., Cicero, Ill.  
 Electrovent Fan & Mfg. Co., Chicago.  
 ● Elgo Shutter & Mfg. Co., Detroit, Mich.  
 Gilliam Mfg. Co., Detroit.  
 Guth Co., Edwin F., St. Louis.  
 Hirschman Co., Inc., W. F., Buffalo, N. Y.  
 International Engineering, Inc., Dayton, O.  
 International Steel Company, Evansville, Ind.  
 Jamieson Mfg. Co., Dallas, Tex.  
 Johnson Fan & Blower Corp., Chicago, Ill.  
 Johnston Co., Wm. W., Dayton, O.

Jordan & Co., Paul R., Indianapolis, Ind.  
 Kelvin-White Co., Boston, Mass.  
 King Ventilating Co., Owatonna, Minn.  
 Kirk & Blum Mfg. Co., Cincinnati, O.  
 Leslie Welding Co., Chicago.  
 Lockjoint Wood Products Co., Wichita, Kan. (Wood; stationary door, wall, window and ceiling)  
 Lohman, Inc., William J., Irvington, N. J.  
 Martin Metal Mfg. Co., Wichita, Kan.  
 Meier Electric & Machine Co., Indianapolis, Ind.  
 Meyer Mfg. Co., Detroit, Mich.  
 ●Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.  
 Myers Electric Co., Pittsburgh, Pa.  
 Peerless Electric Co., Warren, Ohio.  
 Reed Unit-Fans, Inc., New Orleans, La.  
 Richmond Fireproof Door Company, Richmond, Ind.  
 Robertson Co., H. H., Pittsburgh, Pa.  
 Schoedinger Co., F. O., Columbus, O.  
 Signal Electric Mfg. Co., Menominee, Mich.  
 ●Standard Stamping & Perforating Co., Chicago.  
 ●Sturtevant Company, B. F., Hyde Park, Boston, Mass.  
 Supreme Heater & Ventilating Corp., St. Louis.  
 ●Tuttle & Bailey, Inc., New Britain, Conn.  
 ●United States Register Co., Battle Creek, Mich.  
 ●Utility Fan Corporation, Los Angeles, Cal.  
 Van Noorden Co., E., Boston, Mass.  
 ●Victor Electric Products, Inc., Cincinnati, Ohio.  
 Waterloo Register Co., Waterloo, Ia.

#### MACHINERY, REBUILT AND USED

- General Blower Co., Chicago.
- Interstate Machinery Co., Inc., Chicago, Ill.
- Maplewood Machinery Co., Inc., Chicago, Ill.
- Osborn Co., J. M. & L. A., Cleveland, O.
- St. Louis Tool Co., St. Louis.

#### MACHINES, BAR FOLDERS, HAND

- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.
- St. Louis Tool Co., St. Louis.

#### MACHINES, BAR FOLDERS, POWER

- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.

#### MACHINES, BEADING, HAND

- Niagara Machine & Tool Works, Buffalo.
- Packham Crimper Co., Mechanicsburg, Ohio.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Robertson, F. L., Buffalo, N. Y.

#### MACHINES, BEADING, POWER

- Callahan Can Machine Co., Inc., Brooklyn, N. Y.
- Maplewood Machinery Co., Inc., Chicago.
- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Quickwork-Whiting Div., Whiting Corp., Harvey, Ill.
- Swain Mfg. Co., Fred J., St. Louis.

#### MACHINES, BURRING, HAND

- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.

#### MACHINES, BURRING, POWER

- Cincinnati Electrical Tool Co., The, Cincinnati, O.
- Maplewood Machinery Co., Inc., Chicago.
- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Stow Mfg. Co., Binghamton, N. Y.

#### MACHINES, CLEAT BENDING, HAND

- Smith, R. E., Waukegan, Ill.

#### MACHINES, COMBINATION, HAND

(Beading, Burring, Turning, Wiring, etc.)

- Maplewood Machinery Co., Inc., Chicago.
- Niagara Machine & Tool Works, Buffalo.
- Packham Crimper Co., Mechanicsburg, Ohio. (Beading-Rotary Snips)
- Peck, Stow & Wilcox Co., Southington, Conn.

#### MACHINES, COMBINATION, POWER

(Beading, Burring, Turning, Wiring, etc.)

- Maplewood Machinery Co., Inc., Chicago.
- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Quickwork-Whiting Div., Whiting Corp., Harvey, Ill.

#### MACHINES, CRIMPING, HAND

- Niagara Machine & Tool Works, Buffalo.
- Packham Crimper Co., Mechanicsburg, Ohio.
- Peck, Stow & Wilcox Co., Southington, Conn.

#### MACHINES, CRIMPING, POWER

- Maplewood Machinery Co., Chicago.
- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.

#### MACHINES, DOUBLE SEAMER, ROOF, POWER

Maxfield Manufacturing Co., Temple, Tex.

#### MACHINES, ELBOW, HAND

- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.

#### MACHINES, ELBOW, POWER

- Maplewood Machinery Co., Chicago.
- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Whitney Metal Tool Co., Rockford, Ill.

#### MACHINES, FLANGING, HAND

- Binkley Mfg. Co., Warrenton, Mo.
- Lockformer Co., Chicago.
- Maplewood Machinery Co., Inc., Chicago.
- Niagara Machine & Tool Works, Buffalo.
- "Original" Metal Flanging Machine Works, Seattle, Wash.
- Packham Crimper Co., Mechanicsburg, Ohio.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Ward Machinery Co., Chicago, Ill.
- Weiss & Co., H., New York City.

#### MACHINES, FLANGING, POWER

- Bittner Engineering Co., New York City.
- Callahan Can Machine Co., Inc., Brooklyn, N. Y.
- Cleveland Punch & Shear Works Co., Cleveland, O.
- Engineering and Research Corporation, Riverdale, Md.
- Lockformer Co., Chicago.
- Maplewood Machinery Co., Inc., Chicago.
- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Quickwork-Whiting Div., Whiting Corp., Harvey, Ill.
- Swain Mfg. Co., Fred J., St. Louis.

#### MACHINES, GROOVING, HAND

- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.

#### MACHINES, GROOVING, POWER

- Maplewood Machinery Co., Chicago.
- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.

#### MACHINES, GUTTER FORMING, HAND

- Robertson, F. L., Buffalo, N. Y.

#### MACHINES, NIBBLING, HAND

National Machine Tool Co., Racine, Wis.

#### MACHINES, NIBBLING, POWER

- Campbell, Andrew C., Div. of American Chain & Cable Co., Inc., Bridgeport, Conn.
- Independent Pneumatic Tool Co., Chicago. (Portable)
- Libert Machine Co., Green Bay, Wis.
- St. Louis Tool Co., St. Louis.
- Savage Co., W. J., Knoxville, Tenn.

#### MACHINES, PIPE, LOCK FORMING, POWER

Maplewood Machinery Co., Chicago.

#### MACHINES, PITTSBURGH LOCK FORMING

- Binkley Mfg. Co., Warrenton, Mo.
- Lockformer Co., Chicago, Ill.
- Maplewood Machinery Co., Inc., Chicago.
- Rafter Machine Co., Belleville, N. J.
- Whitney Metal Tool Co., Rockford, Ill.

#### MACHINES, PITTSBURGH LOCK OPENERS

Atlas Machine & Tool Co., Portland, Ore.  
 Maplewood Machinery Co., Chicago.

#### MACHINES, ROLLING, CRIMPING, BEADING, POWER

Maplewood Machinery Co., Inc., Chicago.

#### MACHINES, SEAMING, HAND

- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Weiss & Co., H., New York City.

#### MACHINES, SEAMING, POWER

- Callahan Can Machine Co., Inc., Brooklyn, N. Y.
- Maplewood Machinery Co., Chicago.
- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Swain Mfg. Co., Fred J., St. Louis.



### MACHINES, SETTING DOWN, HAND

- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.

### MACHINES, SETTING DOWN, POWER

- Callahan Can Machine Co., Inc., Brooklyn, N. Y.
- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.

### MACHINES, SHEET METAL SHRINKING, POWER

Engineering and Research Corporation, Riverdale, Md.

### MACHINES, SLIP ROLL FORMING, HAND

- Bertsch & Co., Cambridge City, Ind.
- Hendley & Whittemore Co., Beloit, Wis.
- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.

### MACHINES, SLIP ROLL FORMING, POWER

- Bertsch & Co., Cambridge City, Ind.
- Hendley & Whittemore Co., Beloit, Wis.
- Maplewood Machinery Co., Inc., Chicago.
- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.

### MACHINES, SLITTING, HAND

- Bertsch & Co., Cambridge City, Ind.
- Beverly Throatless Shear Co., Chicago.
- Buffalo Forge Co., Buffalo.
- Hendley & Whittemore Co., Beloit, Wis.
- Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Rafter Machine Co., Belleville, N. J.
- Ward Machinery Co., Chicago, Ill.

### MACHINES, SLITTING, POWER

- Bertsch & Co., Cambridge City, Ind.
- Buffalo Forge Co., Buffalo.
- Callahan Can Machine Co., Inc., Brooklyn, N. Y.
- Hendley & Whittemore Co., Beloit, Wis.
- Libert Machine Co., Green Bay, Wis. (Rotary)
- Maplewood Machinery Co., Inc., Chicago.
- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Quickwork-Whiting Div., Whiting Corp., Harvey, Ill.
- Rafter Machine Co., Belleville, N. J.
- St. Louis Tool Co., St. Louis.
- Yoder Co., Cleveland, O.

### MACHINES, SQUARING, POWER

- Bertsch & Company, Cambridge City, Ind.
- Peck, Stow & Wilcox Co., Southington, Conn.

### MACHINES, TIMING, FOR STOKER CONTROLS

- Hansen Mfg. Co., Inc., Princeton, Ind.
- Minneapolis-Honeywell Regulator Co., Minneapolis.
- Paragon Electric Co., Chicago
- Penn Electric Switch Co., Goshen, Ind.

### MACHINES, WIRING, HAND

- Maplewood Machinery Co., Inc., Chicago.
- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.

### MACHINES, WIRING, POWER

- Callahan Can Machine Co., Inc., Brooklyn, N. Y.
- Cleveland Punch & Shear Works Co., Cleveland, O.
- Maplewood Machinery Co., Inc., Chicago.
- Niagara Machine & Tool Works, Buffalo.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Quickwork-Whiting Div., Whiting Corp., Harvey, Ill.
- Yoder Company, Cleveland, O.

### MALLETS, METAL WORKING

- Atlantic India Rubber Works, Inc., Chicago. (Rubber)
- Berns Company, Inc., Otto, Rochester, N. Y. (Dogwood)
- Bersted Co., Martin, Chicago, Ill. (Molded composition)
- Chicago Rawhide Mfg. Co., Chicago, Ill.
- Electric Materials Co., North East, Pa. (Copper)
- Fowler-Pem Co., Emeryville, Cal. (Fiber and Rubber)
- Goodrich Company, B. F., Akron, Ohio.
- Greene, Tweed & Co., New York City.
- Maplewood Machinery Co., Chicago. (Wood)
- Miller Rubber Co., Inc., Akron, O. (Composition)
- Niagara Machine & Tool Works, Buffalo. (Hickory)
- Peck, Stow & Wilcox Co., Southington, Conn. (Wood)
- Reiner & Campbell Co., Inc., Elizabeth, N. J.
- Stanley Tools, New Britain, Conn. (Soft face hammers, hickory, rubber composition)
- Stossel & Sons Co., Carl, Front Royal, Va.
- Warren Handle Works Co., Cortland, Ohio.

### MATS, FOR EVAPORATIVE COOLERS

- Adams Mattress Factory, Fort Worth, Texas.
- Air-O-Line Co., Dallas, Texas. (Aspen Fiber)

American Excelsior Corp., Chicago.

Apex Excelsior Company, Dallas, Texas.

Essick Manufacturing Company, Los Angeles. (Bronze Wool, Aspen Fiber, Redwood Excelsior)

Eugene Excelsior Company, Eugene, Oregon.

Grainger, Inc., W. W., Chicago. (Aspen Fiber)

Levy Bros. Company, Los Angeles.

Morey, Dan, Los Angeles.

Palmer Manufacturing Corp., Phoenix, Ariz. (Aspen Fiber)

### METAL CEILINGS

*See Ceilings, Metal*

### METAL HOSE

*See Hose, Metal*

### METAL PROTECTING

*See Paint, Metal Protecting*

### METAL SPRAY GUNS

*See Guns, Spray, Metals*

### METAL STAMPINGS

*See Stampings, Metal*

### METALS, PERFORATED, SHEET AND PLATE

- Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
- Chicago Perforating Co., Chicago, Ill.
- Cross Engineering Co., Carbondale, Pa.
- Crucible Steel Co. of America, New York City.
- Diamond Manufacturing Co., Wyoming, Pa.
- Erdle Perforating Co., Rochester, N. Y.
- Fairmont Aluminum Co., Fairmont, W. Va.
- Gillian Mfg. Co., Detroit.
- Harrington & King Perforating Co., Chicago, Ill.
- Hendrick Mfg. Co., Carbondale, Pa.
- International Nickel Co., Inc., New York City. (Monel and nickel)
- Johnston & Chapman Co., Chicago, Ill.
- Littleford Bros., Cincinnati, O.
- Manhattan Perforated Metal Co., Inc., Long Island City, N. Y.
- Martin Metal Mfg. Co., Wichita, Kan.
- Mundt & Sons, Charles, Jersey City, N. J.
- Nortmann-Duffke Co., Milwaukee, Wis.
- Reliable Perforating Co., Chicago, Ill.
- Revere Copper and Brass Incorporated, New York City.
- Skinner Htg. & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
- Standard Stamping & Perforating Co., Chicago, Ill.
- Western Wire & Iron Works, Inc., Chicago, Ill.
- Wickwire Spencer Steel Co., New York City.

### METERS, AIR VELOCITY, DIRECT READING

- Detroit Air Conditioning Service Co., Inc., Detroit.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore, Md.
- Illinois Testing Laboratories, Inc., Chicago, Ill.
- Taylor Instrument Companies Rochester, N. Y.

### MOTORS, DAMPER, DUCT, MODULATING OR PROPORTIONING

- Au-Temp-Co Corp., New York City.
- Automatic Temperature Control Co., Inc., Philadelphia.
- Barber-Colman Co., Rockford, Ill.
- Cook Electric Company, Chicago.
- Mercoird Corp., Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Russell Electric Co., Chicago, Ill.
- White Manufacturing Co., St. Paul, Minn.

### MOTORS, DAMPER, DUCT, TWO-POSITION

- Au-Temp-Co. Corp., New York City.
- Automatic Products Co., Milwaukee, Wis.
- Automatic Temperature Control Co., Inc., Philadelphia.
- Barber-Colman Co., Rockford, Ill.
- Cook Electric Co., Chicago, Ill.
- Detroit Lubricator Co., Detroit, Mich.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore, Md.
- Mercoird Corp., Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Penn Electric Switch Co., Goshen, Ind.
- Russell Electric Co., Chicago.
- Sampsel Time Control, Inc., Spring Valley, Ill.
- White Manufacturing Co., St. Paul, Minn.

### MOTORS, DAMPER, FURNACE DRAFT, ELECTRICAL

- Au-Temp-Co. Corp., New York City.
- Automatic Products Co., Milwaukee, Wis.
- Barber-Colman Co., Rockford, Ill.
- Barclay, Inc., Robert, Chicago.
- Cook Electric Co., Chicago, Ill.
- Crise Electric Mfg. Co., Columbus, Ohio.
- Defender Automatic Regulator Co., St. Louis.
- Detroit Lubricator Co., Detroit, Mich.

- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore, Md.
- General Controls Co., Glendale, Cal.
  - Gleason-Avery, Inc., Auburn, N. Y.
  - Mercoid Corp., Chicago, Ill.
  - Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
  - Penn Electric Switch Co., Goshen, Ind.
  - Perfex Corp., Milwaukee, Wis.
  - Pioneer Heat Regulator Division, Master Electric Co., Dayton, O.
  - Russell Electric Co., Chicago, Ill.
  - Sampsel Time Control, Inc., Spring Valley, Ill.
  - Spencer Thermostat Company, Attleboro, Mass.
  - White Manufacturing Co., St. Paul, Minn.
  - White-Rodgers Electric Co., St. Louis.

#### MOTORS, ELECTRIC, FRACTIONAL H. P.

- Baldor Electric Co., St. Louis, Mo.
- Barber-Colman Co., Rockford, Ill. (A. C.)
- Bodine Electric Co., Chicago, Ill.
- Brown-Brockmeyer Co., Inc., Dayton, O.
- Canatsey Electric Mfg. Co., Kansas City, Mo.
- Century Electric Co., St. Louis, Mo.
- Delco Appliance Div., General Motors Sales Corp., Rochester, N. Y.
- Delco Products Division, General Motors Corp., Dayton, O.
- Diehl Mfg. Co., Elizabethport, N. J.
- Emerson Electric Mfg. Co., St. Louis, Mo.
- General Electric Co., Schenectady, N. Y.
- Holtzer-Cabot Electric Co., Boston, Mass.
- Howell Electric Motors Co., Howell, Mich.
- Janette Mfg. Co., Chicago, Ill.
- Leland Electric Co., Inc., Dayton, O.
- Marathon Electric Mfg. Corp., Wausau, Wis.
- Master Electric Co., Dayton, O.
- Ohio Electric Mfg. Co., Cleveland, O.
- Peerless Electric Co., Warren, O.
- Reynolds Electric Company, Chicago.
- Robbins & Myers, Inc., Springfield, O.
- Russell Electric Co., Chicago.
- Small Motors, Inc., Chicago.
- Speedway Mfg. Co., Cicero, Ill.
- Sterling Electric Motors, Inc., Los Angeles.
- Sturtevant Co., B. F., Hyde Park, Boston.
- U. S. Electrical Motors, Inc., Los Angeles.
- Victor Electric Products, Inc., Cincinnati, O.
- Wagner Electric Corp., St. Louis, Mo.
- Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

#### MOTORS, ELECTRIC, 1 H. P. AND OVER

- Allis-Chalmers Mfg. Co., Milwaukee, Wis.
- Allis Co., Louis, Milwaukee, Wis.
- Baldor Electric Co., St. Louis, Mo.
- Bogue Electric Co., Paterson, N. J.
- Brown-Brockmeyer Co., Inc., Dayton, O.
- Burke Electric Co., Erie, Pa.
- Canatsey Electric Mfg. Co., Kansas City, Mo.
- Century Electric Co., St. Louis, Mo.
- Continental Electric Co., Inc., Newark, N. J.
- Crocker-Wheeler Elec. Mfg. Co., Ampere, N. J.
- Delco Products Division, General Motors Corp., Dayton, O.
- Diehl Mfg. Co., Elizabethport, N. J.
- Electric Machinery Mfg. Co., Minneapolis.
- Emerson Electric Mfg. Co., St. Louis.
- Fairbanks, Morse & Co., Chicago, Ill.
- General Electric Co., Schenectady, N. Y.
- Howell Electric Motors Co., Howell, Mich.
- Ideal Electric & Mfg. Co., Mansfield, O.
- Imperial Electric Co., Akron, O.
- Janette Mfg. Co., Chicago, Ill.
- Leland Electric Co., Inc., Dayton, Ohio.
- Lincoln Electric Co., Cleveland, O.
- Marathon Electric Mfg. Corp., Wausau, Wis.
- Marble-Card Electric Co., Gladstone, Mich.
- Master Electric Co., Dayton, O.
- Peerless Electric Co., Warren, O.
- Philadelphia Gear Co., Philadelphia. (Geared)
- Reliance Elec. & Eng. Co., Cleveland.
- Robbins & Myers, Inc., Springfield, O.
- Star Electric Motor Co., Bloomfield, N. J.
- Sterling Electric Motors, Inc., Los Angeles.
- Sturtevant Co., B. F., Hyde Park, Boston.
- U. S. Electrical Motors, Inc., Los Angeles.
- Wagner Electric Corp., St. Louis, Mo.
- Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
- Zobel Electric Motor Corp., Garwood, N. J.

#### MOULDING AND TRIM, ORNAMENTAL, for CABINETS and CASINGS

- Alden Manufacturing Co., Painesville, O.
- Allmetal Weatherstrip Co., Chicago, Ill.
- Aluminum Co. of America, Pittsburgh, Pa.
- Aluminum Goods Mfg. Co., Manitowoc, Wis.
- Brasco Manufacturing Co., Harvey, Ill.
- Briggs Mfg. Co., Detroit.
- Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
- Dahlstrom Metallic Door Co., Jamestown, N. Y.
- Detroit Moulding Div., Detroit.

- Empire Door Co., Inc., New York City.
- Friedley-Voshardt Co., Chicago, Ill.
- Green Mfg. Co., Chicago.
- Herron-Zimmers Moulding Co., Detroit, Mich.
- Jamestown Metal Corp., Jamestown, N. Y.
- Kawneer Co., Niles, Mich.
- Ladon Co., Chicago.
- Lau Blower Co., Dayton, O.
- Ledkote Products Co., Long Island City, N. Y.
- Lees, John, Div. Serrick Corp., Muncie, Ind.
- Martin-Parry Corp., York, Pa.
- Maysteel Products, Inc., Mayville, Wis.
- Mesker & Co., Geo. L., Evansville, Ind.
- Miller & Doing, Inc., Brooklyn, N. Y.
- Pyramid Metals Company, Chicago, Ill.
- United Metal Prod. Div., Canton, Ohio.

#### MOTOR TIMING

- Hansen Mfg. Co., Inc., Princeton, Ind.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Paragon Electric Co., Chicago.
- Penn Electric Switch Co., Goshen, Ind.

#### NAILS, ALUMINUM

- Aluminum Company of America, Pittsburgh, Pa.
- Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.
- Hassall, Inc., John, Brooklyn, N. Y.
- Townsend Co., New Brighton, Pa.

#### NAILS, COPPER

- American Steel & Wire Co., Cleveland.
- Angell Nail & Chaplet Co., Cleveland, O.
- Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.
- Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
- Columbia Steel Co., San Francisco, Cal.
- Conklin Brass & Copper Co., Inc., T. E., New York City.
- Columbia Steel Co., San Francisco, Cal.
- Copperweld Steel Co., Glassport, Pa.
- Downs-Smith Brass & Copper Co., New York City.
- Hassall, Inc., John, Brooklyn, N. Y.
- Hussey & Co., C. G., Pittsburgh, Pa.
- Maze Co., W. H., Peru, Ill.
- Townsend Co., New Brighton, Pa.
- Turner & Seymour Mfg. Co., Torrington, Conn.

#### NAILS, HARDENED MASONRY

- American Steel & Wire Co., Cleveland.
- Parker-Kalon Corp., New York City.
- Rawlplug Co., Inc., New York City.
- Townsend Co., New Brighton, Pa.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Wheeling Steel Corp., Wheeling, W. Va.

#### NAILS, ROOFING

- American Steel & Wire Co., Cleveland.
- Angell Nail & Chaplet Co., Cleveland, O.
- Berger Mfg. Div. of Republic Steel Corp., Canton, O.
- Bethlehem Steel Co., Bethlehem, Pa.
- Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
- Columbia Steel Co., San Francisco, Cal.
- Conklin Brass & Copper Co., Inc., T. E., New York City. (Copper)
- Continental Steel Corp., Kokomo, Ind.
- Deniston Co., Chicago, Ill.
- Dickson Weatherproof Nail Co., Evanston, Ill. (Lead headed)
- Downs-Smith Brass & Copper Co., New York City.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Globe Iron Roofing & Corrugating Co., Newport, Ky.
- Hassall, Inc., John, Brooklyn, N. Y.
- Hussey & Co., C. G., Pittsburgh, Pa.
- Jones & Laughlin Steel Corp., Pittsburgh, Pa.
- Lehon Co., Chicago.
- Malleable Iron Fittings Co., Branford, Conn.
- Maze Co., W. H., Peru, Ill.
- Milcor Steel Co., Milwaukee, Wis.
- National Lead Co., New York City.
- New Delphos Manufacturing Co., Delphos, Ohio.
- Republic Steel Corp., Cleveland, O.
- Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
- Townsend Co., New Brighton, Pa.
- Turner & Seymour Mfg. Co., Torrington, Conn.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Wheeling Steel Corp., Wheeling, W. Va.
- Youngstown Sheet & Tube Co., Youngstown, O.

#### NAILS, SCREW, HARDENED

- Jones & Laughlin Steel Corp., Pittsburgh.
- National Screw & Mfg. Co., Cleveland, O.
- Parker-Kalon Corp., New York City.
- Republic Steel Corp., Cleveland, O.
- Townsend Co., New Brighton, Pa.

#### NAILS, STAINLESS STEEL

- Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.
- Hassall, Inc., John, Brooklyn, N. Y.
- National Screw & Mfg. Co., Cleveland.
- Republic Steel Corp., Cleveland, O.
- Townsend Co., New Brighton, Pa.
- Turner & Seymour Mfg. Co., Torrington, Conn.

## NAILS, ZINC COATED

- American Steel & Wire Co., Cleveland.  
American Zinc Products Co., Greencastle, Ind.  
Angell Nail & Chaplet Co., Cleveland, O.  
Berger Mfg. Div. of Republic Steel Corp., Canton, O.  
● Bethlehem Steel Co., Bethlehem, Pa.  
Columbia Steel Co., San Francisco, Cal.  
● Continental Steel Corp., Kokomo, Ind.  
Hassall, Inc., John, Brooklyn, N. Y.  
Jones & Laughlin Steel Corp., Pittsburgh, Pa.  
Lehon Co., Chicago.  
Malleable Iron Fittings Co., Branford, Conn.  
Maze Co., W. H., Peru, Ill.  
● Republic Steel Corporation, Cleveland.  
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.  
Townsend Co., New Brighton, Pa.  
Wheeling Corrugating Co., Wheeling, W. Va.  
Wheeling Steel Corp., Wheeling, W. Va.  
Youngstown Sheet & Tube Co., Youngstown, O.

## NAME PLATES

*See Hardware, for Cabinets and Casings*

## NIBBLERS

*See Machines, Nibbling*

## NIGHT AIR FANS

*See Fans, Night Air Cooling*

## NOZZLES, SPRAY, WATER

- Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.  
Balloffett Dies & Nozzle Co., Inc., Guttenberg, N. J.  
Benjamin Air Rifle Co., St. Louis.  
Betz Air Conditioning Corp., Kansas City, Mo.  
Binks Mfg. Co., Chicago, Ill.  
Buffalo Forge Co., Buffalo, N. Y.  
Eclipse Air Brush Co., Inc., Newark, N. J.  
Hubbard Company, Minneapolis.  
Link-Belt Co., Chicago.  
● McDonnell & Miller, Chicago.  
● Marley Co., Kansas City, Kan.  
Martocello & Co., Jos. A., Philadelphia, Pa.  
Monarch Mfg. Works, Inc., Philadelphia, Pa.  
Peterson "Freezem" Mfg. & Sales Co., Kansas City, Mo.  
Phillips Cooling Tower Co., Inc., New York City.  
Rega Mfg. Co., Rochester, N. Y.  
Spray Engineering Co., Somerville, Mass.  
Spraying Systems Co., Chicago, Ill.  
Spray Wheel Air Conditioners, Inc., Denver, Colo.  
Strandwitz & Co., Inc., W. J., Camden, N. J.  
● Sturtevant Co., B. F., Hyde Park, Boston, Mass.  
Supreme Electric Products Corp., Rochester, N. Y.  
Water Cooling Corp., New York City.  
Yarnall-Waring Company, Philadelphia.

## NUTS, SHEET METAL

Tinnerman Products, Inc., Cleveland.

## ODOR ADSORBERS

*See Adsorbers, Odor*

## OFFSETS, FURNACE PIPE

*See Fittings and Accessories, Furnace Pipe*

## OIL BURNERS

*See Burners, Oil*

## OXY-ACETYLENE WELDING EQUIPMENT

*See Welding Equipment, Oxy-Acetylene*

## OZONE APPARATUS

- Automatic Pump & Softener Corp., Rockford, Ill.  
Chelsea Fan & Blower Co., Inc., Irvington, N. J.  
Electroaire Corp., Chicago, Ill.  
Lohman, Inc., Wm. J., Irvington, N. J.  
Montgomery Bros., San Francisco, Cal.  
Norwood Filtration Co., The, Florence, Mass.  
Ozone Air Company, Grand Rapids, Mich.  
Ozo-Ray Process Corp., Chicago.  
Russell Electric Company, Chicago.  
Sealkote Corp., Chicago, Ill.  
United States Ozone Co. of America, Scottsdale, Pa.

## PAINT, ALUMINUM

- Acme Refining Co., Cleveland, O.  
Acme White Lead & Color Works, Detroit.  
Acorn Refining Co., Cleveland, O.  
● Allen Co., L. B., Chicago.  
Aluminum Company of America, Pittsburgh, Pa.  
American-Marietta Company, Chicago.  
Asphalt Products Co., Inc., Syracuse, N. Y.  
Baer Brothers, New York City.  
Cabot, Inc., Samuel, Boston, Mass.  
Calbar Paint & Varnish Co., Philadelphia, Pa.  
Carter Paint Co., Liberty, Ind.  
Connors Paint Mfg. Co., Wm., Troy, N. Y.  
Continental Products Co., Euclid, O.  
Cork Import Corp., New York City.

- Debevoise Co., Brooklyn, N. Y.  
Detroit Graphite Company, Detroit.  
Dragert Co., Inc., C. H., Brooklyn, N. Y.  
du Pont de Nemours & Co., E. I., Wilmington, Del.  
Flood Company, Cleveland.  
Gerard Chemical Co., Elizabeth, N. J.  
Glidden Co., Cleveland, O.  
Hague & Co., Inc., Alfred, Brooklyn, N. Y.  
Heath & Milligan Mfg. Co. Div. of Glidden Co., Chicago, Ill.  
Hilo Varnish Corp., Brooklyn, N. Y.  
Horn Co., A. C., Long Island City, N. Y.  
Inter-Coastal Paint Co., East St. Louis, Ill.  
Iowa Paint Mfg. Co., Des Moines, Ia.  
Koppers Co., Pittsburgh, Pa.  
Krehbiel Co., J. H., Chicago.  
Lehon Co., Chicago.  
Lucas & Company, Inc., John, Philadelphia.  
Maas & Waldstein Co., Newark, N. J.  
National Mfg. Corp., Tonawanda, N. Y.  
Nebel Manufacturing Co., Cleveland.  
O'Brien Varnish Co., South Bend, Ind.  
Ohmlac Paint & Refining Co., Chicago, Ill.  
Pittsburgh Plate Glass Company, Pittsburgh.  
Presstite Engineering Co., St. Louis.  
Pyrolite Products Co., Cleveland, O.  
Quigley Company, Inc., New York City. (Vehicle only)  
Roxalin Flexible Lacquer Co., Inc., Elizabeth, N. J.  
Sherwin-Williams Co., Cleveland.  
Sipe & Company, James B., Pittsburgh.  
Sonneborn Sons, Inc., L., New York City.  
Technical Coatings, Inc., Brooklyn, N. Y.  
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.  
Tropical Paint & Oil Co., Cleveland, O.  
Truscon Laboratories, Detroit.  
Wallis Dove-Hermiston Corp., Westfield, N. J.  
Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.  
Wilhelm Co., A., Reading, Pa.  
Wilson Company, Ludwig, Chicago.

## PAINT, CONCRETE, WATERPROOFING

- Acme Refining Co., Cleveland, O.  
Acme White Lead & Color Works, Detroit.  
Acorn Refining Company, Cleveland.  
American-Marietta Company, Chicago.  
Asphalt Products Co., Inc., Syracuse, N. Y.  
Baer Brothers, New York City.  
Barber Asphalt Corp., Barber, N. J.  
Barrett Division, Allied Chemical & Die Corporation, New York City.  
Cabot, Inc., Samuel, Boston, Mass.  
Calbar Paint & Varnish Co., Philadelphia, Pa.  
Connors Paint Mfg. Co., Wm., Troy, N. Y.  
Continental Products Co., Euclid, Ohio.  
Debevoise Co., Brooklyn, N. Y.  
du Pont de Nemours & Co., E. I., Wilmington, Del.  
Flintkote Co., New York City.  
Gerard Chemical Co., Elizabeth, N. J.  
Glidden Co., Cleveland, O.  
Hague & Co., Inc., Alfred, Brooklyn, N. Y.  
Heath & Milligan Mfg. Co., Div. of Glidden Co., Chicago, Ill.  
Hilo Varnish Corp., Brooklyn, N. Y.  
Horn Co., A. C., Long Island City, N. Y.  
Iowa Paint Mfg. Co., Des Moines, Ia.  
Koppers Co., Pittsburgh, Pa.  
Lastik Products Co., Inc., Pittsburgh, Pa.  
Lehon Co., Chicago.  
Lucas & Company, Inc., John, Philadelphia.  
Metropolitan Refining Co., Long Island City, N. Y.  
Nebel Manufacturing Co., Cleveland.  
O'Brien Varnish Co., South Bend, Ind.  
Ohmlac Paint & Refining Co., Chicago, Ill.  
Paint-Point Corp., Newark, N. J.  
Pecora Paint Co., Philadelphia, Pa.  
Pittsburgh Plate Glass Co., Pittsburgh.  
Pyrolite Products Co., Cleveland, O.  
Reilly Tar & Chemical Corp., Indianapolis, Ind.  
Self-Vulcanizing Rubber Co., Inc., Chicago, Ill.  
Sherwin-Williams Co., Cleveland.  
Sonneborn Sons, Inc., L., New York City.  
Southport Paint Co., Savannah, Ga.  
Tamms Silica Co., Chicago, Ill.  
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.  
Toch Brothers, Inc., Elm Park, Staten Island, N. Y.  
Tropical Paint & Oil Co., Cleveland, O.  
Truscon Laboratories, Detroit, Mich.  
U. S. Gutta Percha Paint Co., Providence, R. I.  
United States Gypsum Co., Chicago, Ill.  
Wallis Dove-Hermiston Corp., Westfield, N. J.  
Wilhelm Co., A., Reading, Pa.

## PAINT, COPPER

- Acme White Lead & Color Works, Detroit.  
Baer Brothers, New York City.  
Debevoise Co., Brooklyn, N. Y.  
Glidden Company, Cleveland.  
Lucas & Company, Inc., John, Philadelphia.  
Pittsburgh Plate Glass Co., Pittsburgh.  
Sherwin-Williams Co., Cleveland.  
Sipe & Company, James B., Pittsburgh, Pa.

● Advertisement in this issue. See Index to Advertisers, page 310



Stokes, Jr., J. W., Brooklyn, N. Y.  
U. S. Gutta Percha Paint Co., Providence, R. I.

#### PAINT, CRACKLE FINISH

Acme White Lead & Color Works, Detroit.  
Baer Brothers, New York City.  
Hague & Co., Inc., Alfred, Brooklyn, N. Y.  
Heath & Milligan Mfg. Co., Div. of Glidden Co., Chicago, Ill.  
Hilo Varnish Corp., Brooklyn.  
Inter-Coastal Paint Co., East St. Louis, Ill.  
Iowa Paint Mfg. Co., Des Moines, Ia.  
Lucas & Company, Inc., John, Philadelphia.  
Maas & Waldstein Co., Newark, N. J.  
Patterson-Sargent Co., Cleveland.  
Pittsburgh Plate Glass Co., Pittsburgh.  
Roxalin Flexible Lacquer Co., Inc., Elizabeth, N. J.  
Sherwin-Williams Co., Cleveland.  
Wattenamel Co., Summit, Ill.  
Wilhelm Co., A., Reading, Pa.  
Zapon-Brevolite Division, Atlas Powder Co., North Chicago, Ill.

#### PAINT, HOT SURFACES

Acme Refining Co., Cleveland, O.  
Acme White Lead & Color Works, Detroit.  
Acorn Refining Co., Cleveland, O.  
● Allen Co., L. B., Chicago.  
American Chemical Paint Co., Ambler, Pa.  
American-Marietta Company, Chicago.  
Baer Brothers, New York City.  
Barrett Division, Allied Chemical & Die Corporation, New York City.  
Cabot, Inc., Samuel, Boston, Mass.  
Calbar Paint & Varnish Co. Philadelphia, Pa.  
Carey Co., Philip, Cincinnati, O.  
Carter Paint Co., Liberty, Ind.  
Continental Products Co., Euclid, Ohio.  
Debevoise Co., Brooklyn, N. Y.  
Devoe & Reynolds Co., Inc., New York City.  
du Pont de Nemours & Co., E. I., Wilmington, Del.  
Gerard Chemical Co., Elizabeth, N. J.  
Glidden Co., Cleveland, O.  
Hague & Co., Inc., Alfred, Brooklyn, N. Y.  
Heath & Milligan Mfg. Co., Div. of Glidden Co., Chicago, Ill.  
Hetzel Roofing Products Co., Newark, N. J.  
Hilo Varnish Corp., Brooklyn, N. Y.  
Horn Co., A. C., Long Island City, N. Y.  
Iowa Paint Mfg. Co., Des Moines, Ia.  
Krehbiel Co., J. H., Chicago.  
Laclede-Christy Clay Products Co., St. Louis, Mo.  
Lastik Products Co., Inc., Pittsburgh, Pa.  
Lucas & Company, Inc., John, Philadelphia.  
Metropolitan Refining Co., Long Island City, N. Y.  
National Mfg. Corp., Tonawanda, N. Y.  
Nebel Manufacturing Co., Cleveland.  
O'Brien Varnish Co., South Bend, Ind.  
Ohmlac Paint & Refining Co., Chicago, Ill.  
Patterson-Sargent Co., Cleveland.  
Pittsburgh Plate Glass Co., Pittsburgh.  
Pyrolite Products Co., Cleveland, O.  
Roxalin Flexible Lacquer Co., Inc., Elizabeth, N. J.  
Sauerelsen Cements Co., Sharpsburg, Pa.  
Sherwin-Williams Co., Cleveland.  
Sipe & Company, James B., Pittsburgh.  
Technical Coatings, Inc., Brooklyn, N. Y.  
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.  
Tropical Paint & Oil Co., Cleveland, O.  
Truscon Laboratories, Detroit, Mich.  
U. S. Gutta Percha Paint Co., Providence, R. I.  
Walles Dove-Hermiston Corp., Westfield, N. J.  
Westinghouse Electric & Manufacturing Co., East Pittsburgh.  
Wilson Company, Ludwig, Chicago.  
Wilhelm Co., A., Reading, Pa.

#### PAINT, METAL PROTECTING, FINISH COAT, BRUSH APPLIED

Acme White Lead & Color Works, Detroit.  
American-Marietta Company, Chicago.  
Cheesman-Elliott Co., Inc., Brooklyn.  
Detroit Graphite Company, Detroit.  
Devoe & Reynolds Co., Inc., New York City.  
duPont de Nemours & Company, E. I., Wilmington, Del.  
Horn Company, A. C., Long Island City, N. Y.  
Lucas & Company, Inc., John, Philadelphia.  
Marley Chemical Company, Detroit.  
National Lead Company, New York City.  
North American Fibre Products Co., Cleveland.  
O'Brien Varnish Company, South Bend, Ind.  
Patterson-Sargent Co., Cleveland.  
Pittsburgh Plate Glass Co., Pittsburgh.  
Quigley Company, Inc., New York City.  
Socony Paint Products Company, New York City.  
Sonneborn Sons, Inc., L., New York City.  
Southport Paint Co., Savannah, Ga.  
Toch Brothers, Inc., Elm Park, S. I., N. Y.  
Tamms Silica Company, Chicago.  
Tropical Paint & Oil Co., Cleveland.  
U. S. Gutta Percha Paint Co., Providence, R. I.

U. S. Stoneware Company, Akron, Ohio.  
Wilson Company, Ludwig, Chicago.

#### PAINT, METAL PROTECTING, FINISH COAT, SPRAY APPLIED

Acme White Lead & Color Works, Detroit.  
American-Marietta Company, Chicago.  
Carter Paint Company, Liberty, Indiana.  
Cheesman-Elliott Co., Inc., Brooklyn, N. Y.  
Detroit Graphite Company, Detroit.  
Devoe & Reynolds Co., Inc., New York City.  
duPont de Nemours & Company, E. I., Wilmington, Del.  
Fales Chemical Co., Inc., New York City.  
Lucas & Company, Inc., John, Philadelphia.  
Marley Chemical Company, Detroit.  
National Lead Company, New York City.  
O'Brien Varnish Company, South Bend, Ind.  
Patterson-Sargent Co., Cleveland.  
Pittsburgh Plate Glass Co., Pittsburgh.  
Quigley Company, Inc., New York City.  
Sauerelsen Cements Co., Sharpsburg, Pa.  
Sipe & Company, James B., Pittsburgh.  
Socony Paint Products Company, New York City.  
Sonneborn Sons, Inc., L., New York City.  
Southport Paint Co., Savannah, Ga.  
Tamms Silica Company, Chicago.  
Tropical Paint & Oil Co., Cleveland.  
U. S. Gutta Percha Paint Company, Providence, R. I.  
U. S. Stoneware Company, Akron, Ohio.  
Wilson Company, Ludwig, Chicago.  
Zapon-Brevolite Div., Atlas Powder Co., North Chicago, Ill.

#### PAINT, METAL PROTECTING, PRIME COAT, BRUSH APPLIED

Acme White Lead & Color Works, Detroit.  
American Chemical Paint Co., Ambler, Pa.  
American-Marietta Company, Chicago.  
Carey Mfg. Co., Philip, Cincinnati, Ohio.  
Carter Paint Company, Liberty, Ind.  
Cheesman-Elliott Co., Inc., Brooklyn.  
Detroit Graphite Company, Detroit.  
duPont de Nemours & Company, E. I., Wilmington, Del.  
Devoe & Reynolds Co., Inc., New York City.  
Flood Company, Cleveland.  
Horn Company, A. C., Long Island City, N. Y.  
Lucas & Company, Inc., John, Philadelphia.  
Marley Chemical Company, Detroit.  
National Lead Company, New York City.  
Nebel Manufacturing Co., Cleveland.  
O'Brien Varnish Company, South Bend, Ind.  
Patterson-Sargent Co., Cleveland.  
Pittsburgh Plate Glass Co., Pittsburgh.  
Quigley Company, Inc., New York City.  
Sipe & Company, James B., Pittsburgh.  
Socony Paint Products Company, New York City.  
Sonneborn Sons, Inc., L., New York City.  
Southport Paint Co., Savannah, Ga.  
Tamms Silica Company, Chicago.  
Tropical Paint & Oil Co., Cleveland.  
U. S. Gutta Percha Paint Co., Providence, R. I.  
U. S. Stoneware Company, Akron, Ohio.  
Wilson Company, Ludwig, Chicago.

#### PAINT, METAL PROTECTING, PRIME COAT, SPRAY APPLIED

Acme White Lead & Color Works, Detroit.  
American Chemical Paint Co., Ambler, Pa.  
American-Marietta Company, Chicago.  
Carey Mfg. Co., Philip, Cincinnati, Ohio.  
Carter Paint Company, Liberty, Indiana.  
Cheesman-Elliott Co., Inc., Brooklyn.  
Detroit Graphite Company, Detroit.  
Devoe & Reynolds Co., Inc., New York City.  
duPont de Nemours & Company, E. I., Wilmington, Del.  
Flood Company, Cleveland.  
Hilo Varnish Corporation, Brooklyn.  
Lucas & Company, Inc., John, Philadelphia.  
Marley Chemical Company, Detroit.  
National Lead Company, New York City.  
O'Brien Varnish Company, South Bend, Indiana.  
Patterson-Sargent Co., Cleveland, Ohio.  
Pittsburgh Plate Glass Co., Pittsburgh.  
Quigley Company, Inc., New York City.  
Sipe & Company, James B., Pittsburgh.  
Socony Paint Products Company, New York City.  
Sonneborn Sons, Inc., L., New York City.  
Southport Paint Co., Savannah, Ga.  
Tamms Silica Company, Chicago.  
Tropical Paint & Oil Co., Cleveland.  
U. S. Gutta Percha Paint Co., Providence, R. I.  
U. S. Stoneware Company, Akron, Ohio.  
Wilson Company, Ludwig, Chicago.  
Zapon-Brevolite Div., Atlas Powder Co., North Chicago, Ill.

#### PAINT, ROOFING

Acme Refining Co., Cleveland, O.  
Acme White Lead & Color Works, Detroit.  
Acorn Refining Co., Cleveland.

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American-Marietta Company, Chicago.  
 Asphalt Products Co., Inc., Syracuse, N. Y.  
 Baer Brothers, New York City.  
 Barber Asphalt Corp., Barber, N. J.  
 Barrett Division, Allied Chemical & Die Corporation, New York City. (Pitch)  
 Cabot, Inc., Samuel, Boston, Mass.  
 Calbar Paint & Varnish Co., Philadelphia, Pa.  
 Carey Co., Philip, Cincinnati, O.  
 Carter Paint Co., Liberty, Ind.  
 Cheesman-Elliott Co., Inc., Brooklyn.  
 Clinton Metallic Paint Co., Clinton, N. Y. (Red Metallic and Venetian)  
 Connors Paint Mfg. Co., Wm., Troy, N. Y.  
 Continental Products Co., Euclid, Ohio. (All kinds)  
 Debevoise Co., Brooklyn, N. Y.  
 Devoe & Reynolds Co., Inc., New York City.  
 du Pont de Nemours & Co., E. I., Wilmington, Del.  
 Flintkote Co., New York City.  
 Ford Roofing Products Company, Chicago.  
 Glidden Co., Cleveland, O.  
 Hague & Co., Inc., Alfred, Brooklyn, N. Y.  
 Heath & Milligan Mfg. Co., Div. of Glidden Co., Chicago, Ill.  
 Hetzel Roofing Products Co., Newark, N. J.  
 Horn Co., A. C., Long Island City, N. Y.  
 Inter-Coastal Paint Co., East St. Louis, Ill.  
 Iowa Paint Mfg. Co., Des Moines, Ia. (Asphalt)  
 Koppers Co., Pittsburgh, Pa. (Bituminous)  
 Krehbiel Co., J. H., Chicago.  
 Lastik Products Co., Inc., Pittsburgh, Pa. (Asphalt, Tar)  
 Lehon Co., Chicago.  
 Lucas & Company, Inc., John, Philadelphia.  
 Lyon, Conklin & Co., Inc., Baltimore.  
 Metropolitan Refining Co., Long Island City, N. Y.  
 National Mfg. Corp., Tonawanda, N. Y.  
 Nebel Manufacturing Co., Cleveland.  
 North American Fibre Products Co., Cleveland.  
 Ohmlac Paint & Refining Co., Chicago, Ill. (Asphalt)  
 Pecora Paint Co., Philadelphia, Pa.  
 Pittsburgh Plate Glass Co., Pittsburgh.  
 Pyrolite Products Co., Cleveland, O.  
 Quigley Company, Inc., New York City.  
 Reilly Tar & Chemical Corp., Indianapolis, Ind.  
 Robertson Co., H. H., Pittsburgh.  
 Ruberoid Co., New York City.  
 Rutland Fire Clay Co., Rutland, Vt. (Asphalt)  
 Sherwin-Williams Co., Cleveland.  
 Sipe & Company, James B., Pittsburgh.  
 Southport Paint Co., Savannah, Ga.  
 Sonneborn Sons, Inc., L., New York City.  
 Tamms Silica Co., Chicago, Ill.  
 Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.  
 Toch Brothers, Inc., Elm Park, S. I., N. Y.  
 Tropical Paint & Oil Co., Cleveland, O.  
 Truscon Laboratories, Detroit.  
 U. S. Gutta Percha Paint Co., Providence, R. I.  
 United States Gypsum Co., Chicago.  
 Walles Dove-Hermiston Corp., Westfield, N. J.  
 Wilhelm Co., A., Reading Pa.  
 Wilson Company, Ludwig, Chicago.

## PAINT SPRAY GUNS

*See Guns, Spray, Paint*

## PAPER, ASBESTOS

Acme Asbestos Covering & Flooring Co., Chicago.  
 Barber Asphalt Corp., Barber, N. J.  
 Carey Co., Philip, Cincinnati, O.  
 Ehret Magnesia Mfg. Co., Valley Forge, Pa.  
 ● Grant Wilson, Inc., Chicago.  
 Johns-Manville New York City.  
 Keasbey & Mattison Co., Ambler, Pa.  
 Linear Packing & Rubber Co., Inc., Philadelphia.  
 Norristown Magnesia & Asbestos Co., Norristown, Pa.  
 Ruberoid Co., New York City.  
 ● Sall Mountain Co., Chicago, Ill.  
 Smith & Kanzler Corp., Elizabeth, N. J.  
 Standard Asbestos Mfg. Co., Chicago, Ill.  
 ● Wilson, Inc., Grant, Chicago, Ill.

## PARTS, for HEATING and AIR CONDITIONING EQUIPMENT

*(Tank Heads and Bottoms, Water Heater Legs)*

● Ackermann Manufacturing Company, Wheeling, W. Va. (Furnace Heads)  
 Commercial Shearing & Stamping Co., Youngstown, Ohio.

## PASTE, ASBESTOS PAPER

Acme Asbestos Covering & Flooring Co., Chicago.  
 Clark Stek-O Corp., Rochester, N. Y.  
 ● Grant Wilson, Inc., Chicago.  
 Lyon, Conklin & Co., Inc., Baltimore.  
 Norristown Magnesia & Asbestos Co., Norristown, Pa.  
 Ruberoid Co., New York City.  
 Rutland Fire Clay Co., Rutland, Vt.  
 ● Sall Mountain Co., Chicago, Ill.  
 Smith & Kanzler Corp., Elizabeth, N. J.  
 Standard Asbestos Mfg. Co., Chicago, Ill.

Western Mineral Products Co., Omaha, Nebr.  
 ● Wilson, Inc., Grant, Chicago, Ill.

## PATTERNS, BLUE PRINT, ELBOWS, SKYLIGHTS and FITTINGS

Gray, G. L., New Haven, Conn.

## PERFORATED METAL

*See Metals, Perforated, Sheet and Plate*

## PILLOW BLOCKS

*See Bearings, Pillow Block*

## PIPE, CONDUCTOR

Ames Co., W. R., San Francisco, Cal.  
 Barnes Metal Products Co., Chicago, Ill.  
 Beatrice Steel Tank Mfg. Co., Beatrice, Nebr.  
 ● Berger Bros. Co., Philadelphia, Pa.  
 Berger Mfg. Div. of Republic Steel Corp., Canton, O.  
 Braden Mfg. Co., Terre Haute, Ind.  
 Chase Brass & Copper Co., Incorporated, Waterbury, Conn.  
 Chicago Metal Mfg. Co., Chicago, Ill.  
 ● Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.  
 Downs-Smith Brass & Copper Co., New York City.  
 Edwards Manufacturing Co., Inc., Cincinnati.  
 Globe Iron Roofing & Corrugating Co., Newport, Ky.  
 Herbert & Sons, T. L., Nashville, Tenn.  
 ● Hussey & Co., C. G., Pittsburgh, Pa. (Copper)  
 Klauer Manufacturing Co., Dubuque, Ia.  
 La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.  
 Lamb & Ritchie Co., Cambridge, Mass.  
 Lyon, Conklin & Co., Inc., Baltimore, Md.  
 Martin Metal Mfg. Co., Wichita, Kan.  
 ● Meyer & Bro. Co., F., Peoria, Ill.  
 ● Milcor Steel Co., Milwaukee, Wis.  
 Miller & Doing, Inc., Brooklyn, N. Y.  
 New Delphos Manufacturing Co., Delphos, Ohio.  
 Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.  
 ● Osborn Co., J. M. & L. A., Cleveland, O.  
 Reeves Steel & Mfg. Co., Dover, O.  
 Revere Copper and Brass Incorporated, New York City.  
 Schechter Brothers Company, Philadelphia.  
 Schoedinger Co., F. O., Columbus, O.  
 Sheet Metal Mfg. Co., Inc., Brooklyn.  
 Sheet Metal Products Co., Peoria, Ill.  
 Southern States Iron Roofing Co., Savannah, Ga.  
 Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.  
 Wheeling Corrugating Co., Wheeling, W. Va.  
 Williams-Wallace Co., San Francisco.  
 Woolwine Metal Products Co., Los Angeles, Cal.  
 York Corrugating Co., York, Pa.

## PIPE, FURNACE

Acer & Whedon, Inc., Medina, N. Y.  
 Acme Tin Plate & Roofing Supply Co., Philadelphia, Pa.  
 Biersach & Niedermeyer Co., Milwaukee.  
 Braden Mfg. Co., Terre Haute, Ind.  
 Champion Furnace Pipe Co., Peoria, Ill.  
 Char-Gale Mfg. Co., Minneapolis.  
 Chicago Metal Mfg. Co., Chicago, Ill.  
 ● Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.  
 Cincinnati Stamping Co., Cincinnati, O.  
 Corbman Bros., Inc., Philadelphia, Pa.  
 Detroit Safety Furnace Pipe Co., Detroit, Mich.  
 Excelsior Steel Furnace Co., Chicago, Ill.  
 Excelsior Stove & Mfg. Co., Quincy, Ill.  
 Gray Metal Products, Inc., Rochester, N. Y.  
 Green Colonial Furnace Co., Des Moines, Ia.  
 ● Henry Furnace & Foundry Co., Cleveland, O.  
 Herbert & Sons, T. L., Nashville, Tenn.  
 Home Furnace Co., Holland, Mich.  
 Howes-Woods Company, Charleston, Mass.  
 International Heater Co., Utica, N. Y.  
 Keith Furnace Co., Des Moines, Ia.  
 La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.  
 ● Lamneck Products, Inc., Middletown, O.  
 Lennox Furnace Co., Marshalltown, Ia.  
 Lyon, Conklin & Co., Inc., Baltimore, Md.  
 Majestic Co., Huntington, Ind.  
 Maple City Furnace Co., Monmouth, Ill.  
 Martin Metal Mfg. Co., Wichita, Kan.  
 ● Meyer & Bro. Co., F., Peoria, Ill.  
 ● Milcor Steel Co., Milwaukee, Wis.  
 ● Mueller Furnace Co., L. J., Milwaukee, Wis.  
 ● Osborn Co., J. M. & L. A., Cleveland, O.  
 Parkersburg Iron & Steel Co., Parkersburg, W. Va.  
 ● Payne Furnace & Supply Co., Beverly Hills, Cal.  
 ● Peerless Foundry Co., Indianapolis, Ind.  
 Portland Stove Foundry Co., Portland, Me.  
 Reeves Steel & Mfg. Co., Dover, O.  
 Roberts-Hamilton Co., Minneapolis, Minn.  
 Schechter Brothers Co., Philadelphia, Pa.  
 Schoedinger Co., F. O., Columbus, O.  
 Sheet Metal Mfg. Co., Incorporated, Brooklyn.  
 Sheet Metal Specialty Co., Pittsburgh.  
 Skinner Htg. & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.  
 Standard Furnace & Supply Co., Omaha, Nebr.  
 Stratton & Terstegge Co., Louisville, Ky.  
 Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.  
 ● United States Register Co., Battle Creek, Mich.

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- Wheeling Corrugating Co., Wheeling, W. Va.
- Williamson Heater Co., Cincinnati, O.
- Williams-Wallace Co., San Francisco.

### PIPE, SMOKE

- Acer & Whedon, Inc., Medina, N. Y.
- Acme Tin Plate & Roofing Supply Co., Philadelphia, Pa.
- Airtherm Mfg. Co., St. Louis, Mo.
- Biersach & Niedermeyer Co., Milwaukee.
- Braden Mfg. Co., Terre Haute, Ind.
- Campbell Heating Co., Des Moines, Ia.
- Champion Furnace Pipe Co., Peoria, Ill.
- Char-Gale Mfg. Co., Minneapolis.
- Chicago Metal Mfg. Co., Chicago, Ill.
- Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Cincinnati Stamping Co., Cincinnati, O.
- Corbman Bros., Inc., Philadelphia.
- Detroit Safety Furnace Pipe Co., Detroit, Mich.
- Excelsior Steel Furnace Co., Chicago, Ill.
- Excelsior Stove & Mfg. Co., Quincy, Ill.
- Galva Heater Co., Galva, Ill. (Cast Iron)
- Green Colonial Furnace Co., Des Moines, Ia.
- Henry Furnace & Foundry Co., Cleveland, O.
- Herbert & Sons, T. L., Nashville, Tenn.
- Home Furnace Co., Holland, Mich.
- Howes-Woods Company, Charlestown, Boston.
- International Heater Co., Utica, N. Y.
- Keith Furnace Co., Des Moines, Ia.
- La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
- Lamneck Products, Inc., Middletown, O.
- Lennox Furnace Co., Marshalltown, Ia.
- Lyon, Conklin & Co., Inc., Baltimore, Md.
- Majestic Co., Huntington, Ind.
- Maple City Furnace Co., Monmouth, Ill.
- Marshall Furnace Co., Marshall, Mich.
- Martin Metal Mfg. Co., Wichita, Kan.
- Meyer & Bro. Co., F., Peoria, Ill.
- Milcor Steel Co., Milwaukee, Wis.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Osborn Co., J. M. & L. A., Cleveland, O.
- Parkersburg Iron & Steel Co., Parkersburg, W. Va.
- Patten Co., J. V., Sycamore, Ill.
- Peerless Foundry Co., Indianapolis, Ind.
- Portland Stove Foundry Co., Portland, Me.
- Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
- Reeves Steel & Mfg. Co., Dover, O.
- Roberts-Hamilton Co., Minneapolis, Minn.
- Schechter Brothers Co., Philadelphia, Pa.
- Schoedinger Co., F. O., Columbus, O.
- Sheet Metal Mfg. Co., Inc., Brooklyn.
- Skinner Htg. & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
- Standard Furnace & Supply Co., Omaha, Nebr.
- Ster-Na-Man Foundry Co., Springfield, Ill. (Cast Iron)
- Stratton & Terstegge Co., Louisville, Ky.
- Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.
- United States Register Co., Battle Creek, Mich.
- Waterloo Register Co., Waterloo, Ia. (Cast Iron)
- Wheeling Corrugating Co., Wheeling, W. Va.
- Wilder Manufacturing Company, Niles, O.
- Williamson Heater Co., Cincinnati, O.
- Williams-Wallace Co., San Francisco.
- Wise Furnace Co., Akron, O.

### PIPE LOCK FORMERS

*See Machines, Pipe, Lock Forming*

### PIPE & FITTINGS, GAS VENT AND FLUE

- Char-Gale Mfg. Co., Minneapolis. (blue and galvanized)
- Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Condensation Engineering Corp., Chicago. (Vitreous Enamel)
- Heremetal Company, Minneapolis. (Heresite coated)
- Johns-Manville, New York City.
- Osborn Co., J. M. & L. A., Cleveland.
- Payne Furnace & Supply Co., Beverly Hills, Cal. (Insulated Aluminum)
- Skuttle Sales Co., Detroit.
- Wilder Manufacturing Co., Niles, O. (Chromed, Nicked, Aluminum, Wilderglass, Wilder Metal, Galvanized, Blue)
- Williams-Wallace Co., San Francisco.

### PIPE AND FITTINGS, SHEET METAL

*See Ducts and Fittings, Prefabricated*

### PITTSBURGH LOCK FORMING MACHINES

*See Machines, Pittsburgh Lock Forming*

### PLATE, BEARING, STUDDING SPACE

Adjustable Bearing Plate Co., St. Louis, Mo.

### PLATES, ALLOY

- Allegheny Ludlum Steel Corp., Pittsburgh. (Stainless)
- Aluminum Company of America, Pittsburgh, Pa.
- American Brass Co., Waterbury, Conn. (Copper)
- American Rolling Mill Co., Middletown, O.
- Bethlehem Steel Co., Bethlehem, Pa.
- Bridgeport Brass Co., Bridgeport, Conn.
- Carnegie-Illinois Steel Corp., Pittsburgh.
- Chase Brass & Copper Co., Incorporated, Waterbury, Conn. (Copper and its alloys)

- Colonial Alloys Co., Philadelphia. (Stainless)
- Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago, Ill. (Stainless clad)
- Lukens Steel Co., Coatesville, Pa.
- Republic Steel Corp., Cleveland, O.
- Revere Copper and Brass Incorporated, New York City.
- Universal-Cyclops Steel Corporation, Bridgeville, Pa.
- Youngstown Sheet & Tube Co., Youngstown, O.

### PLATES, STEEL

- American Rolling Mill Co., Middletown, O.
- Bethlehem Steel Co., Bethlehem, Pa.
- Carnegie-Illinois Steel Corp., Pittsburgh, Pa.
- Columbia Steel Co., San Francisco, Cal.
- Granite City Steel Co., Granite City, Ill.
- Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago, Ill. (Stainless clad)
- Inland Steel Co., Chicago, Ill.
- International Steel Co., Evansville, Ind.
- Jones & Laughlin Steel Corp., Pittsburgh, Pa.
- Lukens Steel Co., Coatesville, Pa.
- Otis Steel Co., Cleveland, O.
- Republic Steel Corp., Cleveland.
- Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
- Weirton Steel Co., Weirton, W. Va.
- Wood Steel Co., Alan, Conshohocken, Pa.
- Youngstown Sheet & Tube Co., Youngstown, O.

### PLATES, WROUGHT IRON

Byers Co., A. M., Pittsburgh, Pa.

### POLISHERS

*See Buffers, Grinders, Polishers, Sanders and Finishers, Metal*

### PREFABRICATED DUCTS

*See Ducts and Fittings, Prefabricated*

### PRESSES AND DIES

- Bath & Company, Cyril, Cleveland.
- Bertsch & Co., Cambridge City, Ind.
- Bliss Co., E. W., Toledo, O.
- Callahan Can Machine Co., Inc., Brooklyn, N. Y.
- Cincinnati Shaper Co., Cincinnati, O.
- Cleveland Punch & Shear Works Co., Cleveland, O.
- Dreis & Krump Mfg. Co., Chicago, Ill.
- Grand Rapids Die & Tool Co., Grand Rapids, Mich.
- Henry & Wright Mfg. Co., Hartford, Conn.
- Leslie Welding Co., Chicago. (Hand Punch Press)
- Marshalltown Mfg. Co., Marshalltown, Ia.
- Minster Machine Co., Minster, O.
- New Albany Machine Mfg. Co., New Albany, Ind.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Perkins Machine Co., Warren, Mass.
- Schatz Mfg. Co., Poughkeepsie, N. Y.
- Service Machine Co., Elizabeth, N. J.
- Spun Steel Corp., Canton, O.
- Streine Toll & Mfg. Co., New Bremen, Ohio.
- Swain Mfg. Co., Fred J., St. Louis.
- Verson Allsteel Press Co., Chicago.
- Ward Machinery Co., Chicago.
- Zeh & Hahnemann Co., Newark, N. J.

### PROTECTORS, DOWNSPOUT

*See Fittings and Accessories, Conductor*

### PSYCHROMETERS, SLING AND HAND-ASPIRATED

- American Moistening Co., Providence, R. I.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.
- G. M. Manufacturing Co., New York City.
- H-B Instrument Co., Inc., Philadelphia, Pa.
- Hill Co., E. Vernon, Chicago, Ill.
- Johnson Service Co., Milwaukee.
- Moeller Instrument Co., Brooklyn, N. Y.
- Palmer Co., Norwood, Cincinnati, O.
- Parks-Cramer Co., Fitchburg, Mass.
- Precision Thermometer & Instrument Co., Philadelphia, Pa.
- Scientific Instrument Co., Detroit.
- Tagliabue Mfg. Co., C. J., Brooklyn.
- Taylor Instrument Companies, Rochester, N. Y.
- Weksler Thermometer Corp., New York City.

### PULLEYS, FAN AND MOTOR

- Allis-Chalmers Mfg. Co., Milwaukee, Wis.
- American Pulley Co., Philadelphia, Pa.
- Browning Mfg. Co., Inc., Maysville, Ky.
- Central Die Casting & Mfg. Co., Inc., Chicago.
- Chicago Die Casting Co., Chicago, Ill.
- Congress Die Casting Div., Congress Tool & Die Co., Detroit, Mich.
- Dayton Rubber Mfg. Co., Dayton, Ohio.
- Dick Co., Inc., R. & J., Passaic, N. J.
- Dodge Mfg. Corp., Mishawaka, Ind.
- Duro Metal Products Co., Chicago, Ill.
- Gates Rubber Co., Denver, Colo.
- Goldens' Fdry. & Mach. Co., Columbus, Ga.
- Horton Mfg. Co., Minneapolis, Minn.
- Jones Fdry. & Mach. Co., W. A., Chicago, Ill.
- Lau Blower Co., Dayton, O.



- Landerme Machine & Tool Co., Inc., Detroit.
- Maurey Mfg. Corp., Chicago, Ill.
- Medart Co., St. Louis, Mo.
- Morrison Products, Inc., Cleveland.
- Pyott Fdry. & Mach. Co., Chicago, Ill.
- Reynolds Mfg. Co., Grand Rapids, Mich.
- Rockwood Mfg. Co., Indianapolis, Ind.
- St. Louis Tool Co., St. Louis.
- Smith, Inc., Winfield H., Springfield, N. Y.
- Spun Steel Corp., Canton, O.
- Swift Mfg. Co., Detroit, Mich.
- Utility Fan Corporation, Los Angeles, Cal.
- Wood's Sons Co., T. B., Chambersburg, Pa.

#### PULLEYS, FURNACE CHAIN

- Hart & Cooley Mfg. Co., Holland, Mich.
- Medart Co., St. Louis.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Stover Mfg. & Engine Co., Freeport, Ill.
- United States Register Co., Battle Creek, Mich.

#### PULLEYS, VARIABLE SPEED

- Allis-Chalmers Manufacturing Co., Milwaukee.
- American Pulley Co., Philadelphia.
- Briggs & Stratton, Milwaukee.
- Browning Mfg. Co., Inc., Maysville, Ky.
- Chicago Die Casting Company, Chicago.
- Columbia Vari-Speed Co., Wheaton, Ill.
- Congress Die Casting Div., Congress Tool & Die Co., Detroit.
- Equipment Engineering Co., Minneapolis.
- Gates Rubber Co. Sales Div., Inc., Denver, Colo.
- Ideal Commutator Dresser Co., Sycamore, Ill.
- Lewellen Mfg. Co., Columbus, Ind.
- Link-Belt Co., Chicago.
- Moore Steam Turbine Div., Worthington Pump & Machinery Corp., Wellsville, N. Y.
- Reeves Pulley Co., Columbus, Ind.
- Speedmaster Co., Des Plaines, Ill.
- Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
- White Manufacturing Co., St. Paul.

#### PUMPS, DEEP-WELL

- American-Marsh Pumps, Inc., Battle Creek, Mich.
- Chandler Co., Cedar Rapids, Ia.
- Cook, Inc., A. D., Lawrenceburg, Ind.
- Crane Co., Chicago, Ill.
- Dayton Pump & Mfg. Co., Dayton, O.
- Decatur Pump Co., Decatur, Ill.
- Delco Appliance Div., General Motors Sales Corp., Rochester, N. Y.
- Deming Co., Salem, O.
- Everite Pump & Mfg. Co., Inc., Lancaster, Pa.
- Fairbanks, Morse & Co., Chicago, Ill.
- Goulds Pumps, Inc., Seneca Falls, N. Y.
- Heil Co., Milwaukee, Wis.
- Layne & Bowler, Inc., Memphis, Tenn.
- Meier Electric & Machine Co., Indianapolis, Ind.
- Micro-Westco, Inc., Bettendorf, Ia.
- Monarch Engineering Company, Dayton, Ohio.
- Myers & Bro. Co., F. E., Ashland, O.
- Pacific Pump Works, Huntington Park, Cal.
- Peerless Pump Division, Food Machinery Corporation, Los Angeles.
- Pomona Pump Co., Pomona, Cal.
- Red Jacket Mfg. Co., Davenport, Ia.
- Roper Corp., Geo. D., Rockford, Ill.
- Uniflow Mfg. Co., Erie, Pa.

#### PUMPS FUEL OIL (for Oil Burners)

- Automatic Products Company, Milwaukee. (Oil Burner)
- DeLaval Steam Turbine Co., Trenton, N. J. (For oil burners)
- Kraissl Co., Inc., Hackensack, N. J.
- Monarch Manufacturing Works, Inc., Philadelphia.
- Quimby Pump Co., Inc., Newark, N. J.
- Tuthill Pump Co., Chicago.
- Viking Pump Company, Cedar Falls, Iowa.
- Webster Electric Co., Racine, Wis.

#### PUMPS, SHALLOW-WELL

- American-Marsh Pumps, Inc., Battle Creek, Mich.
- Chandler Co., Cedar Rapids, Ia.
- Chicago Pump Co., Chicago.
- Cook, Inc., A. D., Lawrenceburg, Ind.
- Crane Co., Chicago, Ill.
- Dayton Pump & Mfg. Co., Dayton, O.
- Decatur Pump Co., Decatur, Ill.
- DeLaval Steam Turbine Co., Trenton, N. J.
- Delco Appliance Div., General Motors Sales Corp., Rochester, N. Y.
- Deming Co., Salem, O.
- Everite Pump & Mfg. Co., Inc., Lancaster, Pa.
- Fairbanks, Morse & Co., Chicago, Ill.
- Frederick Iron & Steel Co., Frederick, Md.
- Goulds Pumps, Inc., Seneca Falls, N. Y.
- Heil Co., Milwaukee, Wis.
- Layne & Bowler, Inc., Memphis, Tenn.
- Lewis & Co., Inc., Chas. S., St. Louis.

- Meier Electric & Machine Co., Indianapolis, Ind.
- Micro-Westco, Inc., Bettendorf, Ia.
- Monarch Engineering Company, Dayton, Ohio.
- Morris Machine Works, Baldwinville, N. Y.
- Myers & Bro. Co., F. E., Ashland, Ohio.
- Pacific Pump Works, Huntington Park, Cal.
- Peerless Pump Division Food Machinery Corporation, Los Angeles.
- Pomona Pump Co., Pomona, Cal.
- Red Jacket Mfg. Co., Davenport, Ia.
- Roper Corp., Geo. D., Rockford, Ill.
- Sterling Pump Corporation, Hamilton, O.
- Uniflow Mfg. Co., Erie, Pa.
- Union Steam Pump Co., Battle Creek, Mich.
- Viking Pump Co., Cedar Falls, Ia.
- Weinman Pump Mfg. Co., Columbus, Ohio.

#### PUMPS, WATER CIRCULATING

- Aldrich Pump Co., Allentown, Pa.
- Allis-Chalmers Mfg. Co., Milwaukee, Wis.
- American-Marsh Pumps, Inc., Battle Creek, Mich.
- Buffalo Pumps, Inc., Buffalo, N. Y.
- Chicago Pump Co., Chicago, Ill.
- Decatur Pump Co., Decatur, Ill.
- Deming Co., Salem, O.
- De Laval Steam Turbine Co., Trenton, N. J.
- Economy Pumps, Inc., Chicago.
- Essick Mfg. Co., Los Angeles. (for Evaporative Coolers)
- Everite Pump & Mfg. Co., Inc., Lancaster, Pa.
- Fairbanks, Morse & Co., Chicago, Ill.
- Frederick Iron & Steel Co., Frederick, Md.
- Goulds Pumps, Inc., Seneca Falls, N. Y.
- Ingersoll-Rand, New York City.
- Lecourtenay Co., Newark, N. J.
- Lewis & Co., Inc., Chas. S., St. Louis, Mo.
- Micro-Westco, Inc., Bettendorf, Ia.
- Monarch Engineering Company, Dayton, Ohio.
- Morris Machine Works, Baldwinville, N. Y.
- Myers & Bro. Co., F. E., Ashland, O.
- Nash Engineering Co., South Norwalk, Conn.
- National Steam Pump Co., Upper Sandusky, O.
- Pacific Pump Works Huntington Park, Cal.
- Palmer Electric Co., Detroit, Mich.
- Peerless Pump Division, Food Machinery Corporation, Los Angeles.
- Pernot & Rich, Inc., Los Angeles.
- Pomona Pump Co., Pomona, Cal.
- Quimby Pump Co., Inc., Newark, N. J.
- Red Jacket Mfg. Co., Davenport, Ia.
- Roper Corp., Geo. D., Rockford, Ill.
- Schwitzer-Cummins Co., Indianapolis, Ind.
- Sterling Pump Corporation, Hamilton, O.
- Swaby Mfg. Co., Chicago, Ill.
- Trane Co., LaCrosse, Wis.
- Trimount Rotary Power Co., East Dedham, Mass.
- Uniflow Mfg. Co., Erie, Pa.
- Union Steam Pump Co., Battle Creek, Mich.
- Utility Fan Corporation, Los Angeles.
- Viking Pump Co., Cedar Falls, Ia.
- Well Pump Co., Chicago, Ill.
- Weinman Pump Mfg. Co., Columbus, O.
- Yeomans Bros. Co., Chicago, Ill.

#### PUNCHES AND SHEARS COMBINED, LEVER OPERATED

- Armstrong-Blum Mfg. Co., Chicago, Ill.
- Beatty Machine & Mfg. Co., Hammond, Ind.
- Bertsch & Co., Cambridge City, Ind.
- Bollaert, M., Oakland, Cal.
- Buffalo Forge Co., Buffalo, N. Y.
- Cleveland Punch & Shear Works Co., Cleveland, O.
- Excelsior Tool & Machine Co., East St. Louis, Ill.
- G.D.S. Machinery & Supply Co., New York City.
- Heartley Machine & Tool Co., Toledo, O.
- Hendley & Whittemore Co., Beloit, Wis.
- Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
- National Machine Tool Co., Racine, Wis.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Royersford Foundry & Machine Co., Royersford, Pa.
- Schatz Mfg. Co., Poughkeepsie, N. Y.
- Weiss & Co., H., New York City.

#### PUNCHES, BENCH

- Armstrong-Blum Mfg. Co., Chicago, Ill.
- Bollaert, M., Oakland, Cal.
- Buffalo Forge Co., Buffalo, N. Y.
- Champion Blower & Forge Co., Lancaster, Pa.
- Clough, A. W., Meriden, Conn.
- Excelsior Tool and Machine Co., East St. Louis, Ill.
- Heartley Machine & Tool Co., Toledo, O.
- Hendley & Whittemore Co., Beloit, Wis.
- Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
- Maplewood Machinery Co., Chicago.
- New Albany Machine Mfg. Co., New Albany, Ind.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Schatz Mfg. Co., Poughkeepsie, N. Y.
- Weiss & Co., H., New York City.

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- Whitney Mfg. Co., W. A., Rockford, Ill.
- Whitney Metal Tool Co., Rockford, Ill.
- Wiedemann Machine Co., Philadelphia.

## PUNCHES, COMBINATION HAND AND BENCH

- Armstrong-Blum Mfg. Co., Chicago, Ill.
- Bollaert, M., Oakland, Cal.
- Champion Blower & Forge Co., Lancaster, Pa.
- Heartley Machine & Tool Co., Toledo, O.
- Hendley & Whittemore Co., Beloit, Wis.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Parker-Kalon Corp., New York City.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Schatz Mfg. Co., Poughkeepsie, N. Y.
- Weiss & Co., H., New York City.
- Whitney Mfg. Co., W. A., Rockford, Ill.
- Whitney Metal Tool Co., Rockford, Ill.

## PUNCHES, HAND

- Armstrong-Blum Mfg. Co., Chicago, Ill.
- Bertsch & Co., Cambridge City, Ind.
- Bollaert M., Oakland, Cal.
- Buffalo Forge Co., Buffalo, N. Y.
- Champion Blower & Forge Co., Lancaster, Pa.
- Cleveland Punch & Shear Works Co., Cleveland, O.
- Clough, A. W., Meriden, Conn.
- Crescent Tool Co., Jamestown, N. Y.
- Hendley & Whittemore Co., Beloit, Wis.
- Ingels Elbow Machine Corporation, Chicago.
- Johnson, Inc., Willam, Newark, N. J.
- Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
- Maplewood Machinery Co., Inc., Chicago.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Parker-Kalon Corp., New York City.
- Peck Stow & Wilcox Co., Southington, Conn.
- Schatz Mfg. Co., Poughkeepsie, N. Y.
- Service Machine Co., Elizabeth, N. J.
- Stanley Tools, New Britain, Conn.
- Weiss & Co., H., New York City.
- Whitney Mfg. Co., W. A., Rockford, Ill.
- Whitney Metal Tool Co., Rockford, Ill.
- Wiedemann Machine Co., Philadelphia.

## PUNCHES, POWER

- Beatty Machine & Mfg. Co., Hammond, Ind.
- Bertsch & Co., Cambridge City, Ind.
- Bliss Co., E. W., Toledo, O.
- Buffalo Forge Co., Buffalo, N. Y.
- Callahan Can Machine Co., Inc., Brooklyn, N. Y.
- Cleveland Punch & Shear Works Co., Cleveland, O.
- Engineering and Research Corporation, Riverdale, Md.
- Excelsior Tool and Machine Co., East St. Louis, Ill.
- Hendley & Whittemore Co., Beloit, Wis.
- Henry & Wright Mfg. Co., Hartford, Conn.
- New Albany Machine Mfg. Co., New Albany, Ind.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Perkins Machine Co., Warren, Mass.
- Royersford Foundry & Machine Co., Royersford, Pa.
- Schatz Mfg. Co., Poughkeepsie, N. Y.
- Service Machine Co., Elizabeth, N. J.
- Streine Tool & Mfg. Co., New Bremen, Ohio.
- Swaine Mfg. Co., Fred J., St. Louis, Mo.
- Verson Allsteel Press Co., Chicago.
- Weiss & Co., H., New York City.
- Whitney Metal Tool Co., Rockford, Ill.
- Wiedemann Machine Co., Philadelphia.
- Zeh & Hahnemann Co., Newark, N. J.

## QUADRANTS, DAMPER

*See Regulators, Damper Sets*

## RECORDERS, HUMIDITY, PORTABLE

- Bristol Co., Waterbury, Conn.
- Brown Instrument Co., Div. of Minneapolis-Honeywell Reg. Co., Philadelphia, Pa.
- Foxboro Co., Foxboro, Mass.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore, Md.
- Marsh Corporation, Jas. P., Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Scientific Instrument Co., Detroit.
- Tagliabue Mfg. Co., C. J., Brooklyn.
- Taylor Instrument Companies, Rochester, N. Y.

## RECORDERS, TEMPERATURE, PORTABLE

- Bailey Meter Company, Cleveland.
- Bristol Co., Waterbury, Conn.
- Brown Instrument Co., Div. of Minneapolis-Honeywell Reg. Co., Philadelphia, Pa.
- Defender Automatic Regulator Co., St. Louis.
- Foxboro Co., Foxboro, Mass.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore, Md.
- Marsh Corporation, Jas. P., Chicago.
- Mason-Nellan Regulator Co., Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Moeller Instrument Co., Richmond Hill, New York City.

- Practical Instrument Co., Chicago, Ill.
- Scientific Instrument Co., Detroit.
- Tagliabue Mfg. Co., C. J., Brooklyn.
- Taylor Instrument Companies, Rochester, N. Y.

## REFRACTORIES

- Babcock & Wilcox Co., New York City.
- Chapman Clay Co., Zanesville, O.
- Chicago Fire Brick Co., Chicago, Ill.
- Fireline Stove & Furnace Lining Co., Chicago.
- General Insulating Products Co., Brooklyn.
- Gilbert & Son, Harry E., Bridgeport, Conn. (Radiant)
- Green Fire Brick Co., A. P., Mexico, Mo.
- Johns-Manville, New York City. (Cement and monolithic)
- Krehbiel Co., J. H., Chicago, Ill.
- Laclede-Christy Clay Products Co., St. Louis, Mo. (Moldable Plastic)
- McLeod & Henry Co., Inc., Troy, N. Y. (Silicon Carbide)
- Munn and Steele, Inc., Newark, N. J.
- Plibrico Jointless Firebrick Co., Chicago.
- Preferred Utilities Mfg. Corp., New York City.
- Pyrolite Products Co., Cleveland, O.
- Quigley Company, Inc., New York City. (Firebrick and Cements)
- Ramtite Co., Chicago. (Castable)
- Refractory & Insulation Corp., New York City.
- Rex Clay Products Co., Detroit, Mich.
- Robinson Insulation Co., Great Falls, Mont.
- Ruberoid Co., New York City.
- Schundler & Co., Inc., F. E., Joliet, Ill.
- Standard Fuel Engineering Co., Detroit, Mich.
- U. S. Stoneware Company, Akron, Ohio.
- Universal Zonolite Insulation Co., Chicago. (Brick and Cement)
- Walsh Refractories Corp., St. Louis, Mo.

## REGISTER SHIELDS

*See Shields, Warm Air Register*

## REFRIGERATING UNITS

*See Compressors, Refrigerating*

## REGISTERS, DIRECTIONAL FLOW

- Adelta Manufacturing Co., Philadelphia.
- Air Control Products, Inc., Coopersville, Mich.
- Airo-Fin Grille Co., Detroit.
- Auer Register Co., Cleveland, O.
- Barber-Colman Co., Rockford, Ill.
- Char-Gale Mfg. Co., Minneapolis.
- Diamond Manufacturing Co., Wyoming, Pa.
- Elsey Metal Specialties Co., Detroit, Mich.
- Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
- Gillian Mfg. Co., Detroit.
- Hart & Cooley Mfg. Co., Holland, Mich.
- Hendrick Mfg. Co., Carbondale, Pa.
- Independent Register Co., Cleveland, O.
- Kauffman Air Conditioning Corp., St. Louis.
- Middleton Mfg. & Sales Co., Minneapolis.
- Register & Grille Mfg. Co., Brooklyn, N. Y.
- Rock Island Register Co., Rock Island, Ill.
- Standard Stamping & Perforating Co., Chicago.
- Tuttle & Bailey, Inc., New Britain, Conn.
- United States Register Co., Battle Creek, Mich.
- Waterloo Register Co., Waterloo, Ia.

## REGISTERS, HEATING AND VENTILATING

- Acme Tin Plate & Roofing Supply Co., Philadelphia.
- Adelta Manufacturing Co., Philadelphia.
- Air Control Products, Inc., Coopersville, Mich.
- Airo-Fin Grille Co., Detroit.
- Auer Register Co., Cleveland, O.
- Barber-Colman Co., Rockford, Ill.
- Best Register Co., Milwaukee, Wis.
- Decatur Iron & Steel Co., Decatur, Ala.
- Diamond Mfg. Co., Wyoming, Pa.
- Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
- Gillian Mfg. Co., Detroit.
- Hart & Cooley Mfg. Co., Holland, Mich.
- Hendrick Mfg. Co., Carbondale, Pa.
- Independent Register Co., Cleveland, O.
- Kauffman Air Conditioning Corp., St. Louis.
- Lamneck Products, Inc., Middletown, O.
- Middleton Mfg. & Sales Co., Minneapolis.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Newman Brothers, Inc., Cincinnati, O.
- Pacific Gas Radiator Co., Huntington Park, Cal.
- Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
- Roberts-Hamilton Co., Minneapolis, Minn.
- Rock Island Register Co., Rock Island, Ill.
- Standard Stamping & Perforating Co., Chicago.
- Tuttle & Bailey, Inc., New Britain, Conn.
- United States Register Co., Battle Creek, Mich.
- Waterloo Register Co., Waterloo, Ia.
- Wood Industries, Inc., Gar, Detroit.

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## REGULATORS, DAMPER SETS

- Adams Company, The, Dubuque, Ia.
- Air Control Products, Inc., Coopersville, Mich.
- California Cornice, Steel and Supply Corp., Los Angeles, Cal.
- Cole-Sullivan Engineering Co., Minneapolis.
- Fossum Mfg. Co., M. H., St. Paul, Minn.
- Gerett Co., M. A., Milwaukee.
- Goese Mfg. Co., Milwaukee, Wis.
- Hart & Cooley Mfg. Co., Holland, Mich.
- Joal Mfg. Corp., Toledo.
- Kerentoff, G. L., Cincinnati.
- Northern Weatherstrip Co., Duluth, Minn.
- Ohio Products Co., Cleveland.
- Parker-Kalon Corp., New York City.
- United States Register Company, Battle Creek, Mich.
- Young Regulator Co., Cleveland.

## REGULATORS, DRAFT, SMOKE PIPE

- Atlas Valve Company, Newark, N. J.
- Cleveland Steel Products Corp., Toridheet Div., Cleveland.
- Cole-Sullivan Engineering Co., Minneapolis, Minn.
- Defender Automatic Regulator Co., St. Louis.
- Field Control Division, Mendota, Ill.
- Gilbert & Barker Mfg. Co., Springfield, Mass.
- Gold Seal Furnace Co., Minneapolis, Minn. (Automatic)
- Harvey-Whipple, Inc., Springfield, Mass.
- Hotstream Heater Co., Cleveland, O. (Automatic)
- James Regulator Co., Inc., Pottsville, Pa.
- Piatt Products Corporation, Lansing, Mich.
- Polk Mfg. Co., Madison, Wis.
- Preferred Utilities Mfg. Corp., New York City.
- Simplex Mfg. Co., Fond du Lac, Wis.
- Walker Mfg. & Sales Corp., St. Joseph, Mo.
- Wisconsin Heating & Draft Control Co., Oshkosh, Wis.

## REGULATORS, FURNACE DRAFT, MECHANICAL

- Au-Temp Co Corp., New York City.
- Defender Automatic Regulator Co., St. Louis.
- Fulton Syphon Co., Knoxville, Tenn.
- Gleason-Avery, Inc., Auburn, N. Y.
- Hart & Cooley Mfg. Co., Holland, Mich.
- Hays Corp., Michigan City, Ind.
- Little Janitor Furnace Clock Co., New York City.
- Mercoid Corp., Chicago, Ill.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Tem Products Co., Midland, Pa.
- Timm & Son, P. C., Lincoln, Nebr.
- Uni-Therm Products Co., Elyria, O.
- Wisconsin Heating & Draft Control Co., Oshkosh, Wis.

## RELAYS, ELECTRICAL

- Advance Electric Co., Los Angeles, Cal.
- Allen-Bradley Co., Milwaukee, Wis.
- American Instrument Co., Silver Spring, Md.
- Arrow-Hart & Hegeman Elect. Co., Hartford, Conn.
- Au-Temp-Co Corp., New York City.
- Automatic Switch Co., New York City.
- Automatic Temperature Control Co., Inc., Philadelphia.
- Barber-Colman Co., Rockford, Ill.
- Bender Warrick Corp., Birmingham, Mich.
- Benjamin Elec. Mfg. Co., Des Plaines, Ill.
- Boston Auto Gage Co., Pittsfield, Mass.
- Clark Controller Co., Cleveland, O.
- Consolidated Car-Heating Co., Inc., Albany, N. Y.
- Cook Electric Co., Chicago, Ill.
- Cramer Company, Inc., R. W., Centerbrook, Conn.
- Cutler-Hammer, Inc., Milwaukee, Wis.
- Detroit Lubricator Co., Detroit, Mich.
- Dunn, Inc., Struthers, Philadelphia, Pa.
- Durakool, Inc., Elkhart, Ind. (Mercury)
- Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
- Electric Controller & Mfg. Co., Cleveland, O.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore, Md.
- General Controls Co., Glendale, Cal.
- General Electric Co., Schenectady, N. Y.
- Gleason-Avery, Inc., Auburn, N. Y.
- Guardian Electric Mfg. Co., Chicago, Ill.
- H-B Instrument Co., Inc., Philadelphia, Pa.
- Hart Mfg. Co., Hartford, Conn.
- Industrial Engineering Corp., Terre Haute, Ind.
- Jefferson Electric Co., Bellwood, Ill.
- McCorkle Co., D. H., Berkeley, Cal.
- Magnet Switch Co., Chicago.
- Mercoid Corp., Chicago, Ill.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Monitor Controller Co., Baltimore, Md.
- National Time & Signal Corp. Detroit.
- Penn Electric Switch Co., Goshen, Ind.
- Perfex Corp., Milwaukee, Wis.
- Philadelphia Thermometer Co., Philadelphia.
- Precision Thermometer & Instrument Co., Philadelphia, Pa.
- Spencer Thermostat Co., Attleboro, Mass.
- Square D Co., Detroit.
- Taylor Instrument Companies, Rochester, N. Y.
- Triplex Mfg. Co., Peru, Ind.
- Ward Leonard Electric Co., Mt. Vernon, N. Y.

- Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
- Weston Electrical Instrument Corp., Newark, N. J.
- White-Rodgers Electric Co., St. Louis.
- Zenith Electric Co., Chicago, Ill.

## REPAIRS, STOVE AND FURNACE

- Adams Company, The, Dubuque, Ia.
- Associated Heater Parts Co., Chicago, Ill.
- Banner Repair Parts Co., Youngstown, O.
- Brauer Supply Co., A. G., St. Louis, Mo.
- Capitol Furnace & Stove Repair Co., Indianapolis, Ind.
- Central Furnace & Stove Repair Co., St. Louis, Mo.
- Cincinnati Stamping Co., Cincinnati, O.
- Clark Co., Henry N., Boston.
- Des Moines Stove Repair Co., Des Moines, Ia.
- Eselgroth & Co., Newark, N. J.
- Faultless Heater Corp., Cleveland, O.
- Homer Furnace & Foundry Corp., Coldwater, Mich.
- Livingston Repair, Marshall, Mich.
- Manufacturers Successors, Inc., New York City.
- Metzner Stove Repair Co., Kansas City, Mo.
- Miller & Son, C. Arthur, Elmira, N. Y. (Furnace)
- National Foundry & Furnace Co., Dayton, O.
- Northwestern Stove Repair Co., Chicago, Ill.
- Omaha Stove Repair Works, Omaha, Neb.
- Peerless Foundry Co., Indianapolis, Ind.
- Peninsular Stove Co., Detroit, Mich.
- Pittsburgh Furnace Parts Co., Pittsburgh, Pa.
- Portland Stove Foundry Co., Portland, Me.
- Shambles Furnace Parts Co., Pittsburgh, Pa.
- Stiglitz Furnace & Foundry Co., Louisville, Ky.
- Stove Manufacturers Corporation, Newark, N. J.
- Wayne Pattern & Foundry Co., Fort Wayne, Ind.

## RETIMNING EQUIPMENT and MATERIALS

Retinning Manufacturing Co., Chicago.

## RIDGE ROLLS AND RIDGING (METAL)

- American Rolling Mill Co., Middletown, O. (Galvanized)
- Ames Co., W. R., San Francisco, Cal.
- Barnes Metal Products Co., Chicago, Ill.
- Beatrice Steel Tank Mfg. Co., Beatrice, Nebr.
- Berger Bros. Co., Philadelphia, Pa.
- Berger Mfg. Div. of Republic Steel Corp., Canton, O.
- Bethlehem Steel Co., Bethlehem, Pa. (Metal)
- Biersach & Niedermeyer Co., Milwaukee.
- Chase Brass & Copper Co., Inc., Waterbury, Conn.
- Downs-Smith Brass & Copper Co., New York City.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Hussey & Co., C. G., Pittsburgh, Pa. (Copper)
- Klauser Mfg. Co., Dubuque, Ia.
- La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
- Lamb & Ritchie Co., Cambridge, Mass.
- Lyon, Conklin & Co., Inc., Baltimore, Md.
- Martin Metal Mfg. Co., Wichita, Kan.
- Milcor Steel Co., Milwaukee, Wis.
- New Delphos Manufacturing Co., Delphos, Ohio.
- Newport Rolling Mill Co., Newport, Ky.
- Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
- Osborn Co., J. M. & L. A., Cleveland, O.
- Reeves Steel & Mfg. Co., Dover, O.
- St. Paul Corrugating Co., St. Paul, Minn.
- Schoedinger Co., F. O., Columbus, O.
- Sheet Metal Mfg. Co., Inc., Brooklyn.
- Southbridge Roofing Co., Inc., Southbridge, Mass.
- Southern States Iron Roofing Co., Savannah, Ga.
- Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
- Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.
- Van Noorden Co., E., Boston, Mass.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Willis Steel Corporation, Galesburg, Ill.
- Williams-Wallace Co., San Francisco, Cal.
- Woolwine Metal Products Co., Los Angeles, Cal.
- Youngstown Sheet & Tube Co., Youngstown, O.

## RIDGE VENTILATORS

See Ventilators, Roof, Ridge

## RIVETS, ALLOY

- Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.
- Bethlehem Steel Co., Bethlehem, Pa.
- Clark Bros. Bolt Co., Milldale, Conn.
- General Plate Div. Metals & Controls Corp., Attleboro, Mass.
- National Screw & Mfg. Co., Cleveland.
- Republic Steel Corp., Cleveland, O.
- Townsend Co., New Brighton, Pa.
- Tubular Rivet & Stud Co., Wollaston, Mass.

## RIVETS, ALUMINUM

- Aluminum Company of America, Pittsburgh, Pa.
- Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.
- Bridgeport Screw Co., Bridgeport, Conn.
- Chicago Rivet & Machine Co., Bellwood, Ill.
- Continental Screw Co., New Bedford, Mass.
- Hassall, Inc., John, Brooklyn, N. Y.
- Townsend Co., New Brighton, Pa.
- Tubular Rivet & Stud Co., Wollaston, Mass.

● Advertisement in this issue. See Index to Advertisers, page 310



## RIVETS, BRASS, COPPER AND IRON

- Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.
- Blake & Johnson Co., Waterville, Conn.
- Bridgeport Screw Co., Bridgeport, Conn.
- Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
- Chicago Rivet & Machine Co., Bellwood, Ill.
- Conklin Brass & Copper Co., Inc., T. E., New York City.
- Continental Screw Co., New Bedford, Mass.
- Downs-Smith Brass & Copper Co., New York City.
- Hassall, Inc., John, Brooklyn, N. Y.
- Hussey & Co., C. G., Pittsburgh, Pa.
- National Screw & Mfg. Co., Cleveland, O.
- Taunton & Company, Inc., John H., New York City.
- Tubular Rivet & Stud Co., Wollaston, Mass.

## RIVETS, STEEL

- Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.
- Atlantic Steel Company, Atlanta, Ga.
- Atlas Bolt & Screw Co., Cleveland, O.
- Bethlehem Steel Co., Bethlehem, Pa.
- Chicago Rivet & Machine Co., Bellwood, Ill.
- Clark Bros. Bolt Co., Milldale, Conn.
- National Screw & Mfg. Co., Cleveland.
- Republic Steel Corporation, Cleveland.
- Townsend Co., New Brighton, Pa.
- Tubular Rivet & Stud Co., Wollaston, Mass.

## ROD, GAS WELDING

- Air Reduction Sales Co., New York City.
- American Agile Corporation, Cleveland.
- American Brass Co., Waterbury, Conn.
- American Steel & Wire Co., Cleveland.
- Atlantic Steel Company, Atlanta, Ga.
- Bridgeport Brass Co., Bridgeport, Conn.
- Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
- Crucible Steel Co. of America, New York City.
- Duraloy Co., Scottsdale, Pa. (Stainless)
- Imperial Brass Mfg. Co., Chicago, Ill.
- International Nickel Co., Inc., New York City. (Monel)
- Linde Air Products Co., The, New York City.
- Maurath, Inc., Cleveland, O.
- Milburn Co., Alexander, Baltimore, Md.
- Modern Engineering Co., St. Louis.
- National Cylinder Gas Co., Chicago.
- Page Steel & Wire Div., Monessen, Pa. (Stainless Steel)
- Republic Steel Corporation, Cleveland.
- Revere Copper and Brass Incorporated, New York City.
- Roebbing's Sons Co., John A., Trenton, N. J.
- Seneca Wire & Mfg. Co., Fostoria, Ohio.
- Torch Weld Equipment Div., National Cylinder Gas Co., Chicago, Ill.
- Universal Power Corporation, Cleveland.
- Walworth Co., New York City.
- Wickwire Spencer Steel Co., New York City.
- Youngstown Sheet & Tube Co., Youngstown, O.

## ROLLER BEARINGS

*See Bearings, Roller*

## ROOFING, ALUMINUM

- Air-O-Cel Industries, Inc., Detroit.
- Fingles Co., The, Baltimore, Md.

## ROOFING, BUILT-UP

- Air-O-Cel Industries, Inc., Detroit.
- American Brass Co., Waterbury, Conn. (Thin copper)
- Barber Asphalt Corp., Barber, N. J.
- Barber Co., Inc., Philadelphia, Pa.
- Barrett Division, Allied Chemical & Die Corporation, New York City.
- Cabot, Inc., Samuel, Boston, Mass.
- Carey Co., Philip, Cincinnati, O.
- Certain-teed Products Corp., New York City.
- Detroit Steel Products Co., Detroit.
- Flintkote Co., New York City.
- Ford Roofing Products Co., Chicago.
- Johns-Manville, New York City.
- Koppers Co., Pittsburgh. (Pitch and Felt)
- Lehon Company, Chicago.
- Logan-Long Co., Chicago, Ill.
- National Mfg. Corp., Tonawanda, N. Y.
- Reilly Tar & Chemical Corp., Indianapolis, Ind.
- Robertson Co., H. H., Pittsburgh, Pa.
- Ruberoide Co., New York City.
- Southport Paint Co., Savannah, Ga.
- United States Gypsum Co., Chicago, Ill.

## ROOFING, COPPER

- American Brass Co., Waterbury, Conn.
- Braden Mfg. Co., Terre Haute, Ind.
- Bridgeport Brass Co., Bridgeport, Conn.
- Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
- Conklin Brass & Copper Co., Inc., T. E., New York City.
- Copper Roofs Corp., Milwaukee.
- Downs-Smith Brass & Copper Co., New York City.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Fingles Co., The, Baltimore, Md.
- Hussey & Co., C. G., Pittsburgh, Pa.

- Klauer Manufacturing Co., Dubuque, Ia.
- Milcor Steel Co., Milwaukee, Wis.
- National Brass & Copper Co., Inc., Lisbon, O.
- New Haven Copper Co., Seymour, Conn.
- Perkinson & Brown, Chicago.
- Revere Copper and Brass Incorporated, New York City.

## ROOFING, IRON

- American Rolling Mill Co., Middletown, O.
- Berger Mfg. Div., Republic Steel Corp., Canton, O.
- Byers Co., A. M., Pittsburgh, Pa. (Wrought Iron)
- Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Globe Iron Roofing & Corrugating Co., Newport, Ky.
- International Steel Company, Evansville, Ind.
- Martin Metal Mfg. Co., Wichita, Kan.
- New Delphos Manufacturing Co., Delphos, Ohio.
- Republic Steel Corp., Cleveland, O.
- Southern States Iron Roofing Co., Savannah, Ga.
- Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
- Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.

## ROOFING, LEAD

- Alpha Metal & Rolling Mills, Inc., Brooklyn.
- Andrews Lead Co., Inc., Long Island City.
- Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
- Copper Roofs Corporation, Milwaukee.
- Eagle-Picher Lead Co., Cincinnati, Ohio.
- Fingles Co., The, Baltimore, Md.
- Flemm Lead Co., Inc., Long Island City, N. Y.
- National Lead Co., New York City.
- Northwest Lead Company, Seattle, Wash.
- Revere Copper and Brass Incorporated, New York City.
- Rochester Lead Works, Rochester, N. Y.
- Standard Rolling Mills, Inc., Brooklyn, N. Y.

## ROOFING, SLATE

- Chapman Slate Co., Bethlehem, Pa.
- Flemm Lead Company, Inc., Long Island City, N. Y.
- Jackson-Bangor Slate Co., Pen Argyl, Pa.
- North Bangor Slate Co., Bangor, Pa.
- Perkinson & Brown, Chicago.
- Rising & Nelson Slate Co., West Pawlet, Vt.
- Sheldon Slate Products Co., Inc., Granville, N. Y.
- Structural Slate Co., Pen Argyl, Pa.
- Vendor Slate Co., Inc., Nazareth, Pa.
- Vermont Structural Slate Co., Fair Haven, Vt.

## ROOFING, STEEL

- Allegheny Ludlum Steel Corp., Pittsburgh.
- American Rolling Mill Co., Middletown, Ohio.
- Apollo Steel Company, Apollo, Pa.
- Beatrice Steel Tank Mfg. Co., Beatrice, Nebr.
- Berger Mfg. Div. Republic Steel Corp., Canton, Ohio.
- Bethlehem Steel Co., Bethlehem, Pa.
- Carnegie-Illinois Steel Corp., Pittsburgh.
- Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Columbia Steel Co., Sub. U. S. Steel Corp., San Francisco.
- Continental Steel Corp., Kokomo, Ind.
- Detroit Steel Products Co., Detroit.
- Edwards Manufacturing Co., Inc., Cincinnati.
- Globe Iron Roofing & Corrugating Co., Newport, Ky.
- International Steel Company, Evansville, Ind.
- Jones & Laughlin Steel Corp., Pittsburgh.
- Klauer Manufacturing Co., Dubuque, Ia.
- Martin Metal Mfg. Co., Wichita, Kan.
- Milcor Steel Co., Milwaukee.
- New Delphos Manufacturing Co., Delphos, Ohio.
- Parkersburg Iron & Steel Co., Parkersburg, W. Va.
- Perkinson & Brown, Chicago.
- Reeves Steel & Mfg. Co., Dover, Ohio.
- Republic Steel Corp., Cleveland.
- Robertson Co., H. H., Pittsburgh.
- St. Paul Corrugating Co., St. Paul, Minn.
- Southern States Iron Roofing Co., Savannah, Ga.
- Superior Sheet Steel Co. Div. Continental Steel Corp., Canton, O.
- Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
- Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.
- Truscon Steel Co., Youngstown, Ohio.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Wheeling Steel Corporation, Wheeling, W. Va.
- Youngstown Sheet & Tube Co., Youngstown, Ohio.

## ROOFING, TERNE PLATE

- Berger Mfg. Div., Republic Steel Corp., Canton, Ohio.
- Bethlehem Steel Co., Bethlehem, Pa.
- Carnegie-Illinois Steel Corp., Pittsburgh.
- Cincinnati Sheet Metal & Roofing Co., Cincinnati, Ohio.
- Follansbee Steel Corporation, Pittsburgh.
- Klauer Manufacturing Co., Dubuque, Ia.
- Martin Metal Mfg. Co., Wichita, Kan.
- Milcor Steel Co., Milwaukee.
- New Delphos Manufacturing Co., Delphos, Ohio.
- Republic Steel Corp., Cleveland.
- Southern States Iron Roofing Co., Savannah, Ga.
- Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.
- Weirton Steel Co., Weirton, W. Va.

Wheeling Metal & Mfg. Co., Moundsville, W. Va.  
 Wheeling Steel Corp., Wheeling, W. Va.  
 Youngstown Sheet & Tube Co., Youngstown, Ohio.

### ROOFING, TILE (CLAY & CONCRETE)

Hood Co., B. Mifflin, Daisy, Tenn. (Clay)  
 Ludowici-Celadon Co., Chicago, Ill.  
 Murray Tile Co., Cloverport, Ky.  
 National Fireproofing Corp., Pittsburgh.  
 Perkinson & Brown, Chicago.  
 Truscon Laboratories, Detroit.  
 United States Gypsum Co., Chicago.

### ROOFING, TIN

Berger Mfg. Div. of Republic Steel Corp., Canton, O.  
 Carnegie-Illinois Steel Corp., Pittsburgh, Pa.  
 • Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.  
 Follansbee Steel Corporation, Pittsburgh, Pa.  
 Klauer Manufacturing Co., Dubuque, Ia.  
 Martin Metal Mfg. Co. Wichita, Kan.  
 • Milcor Steel Co., Milwaukee, Wis.  
 New Delphos Manufacturing Co., Delphos, Ohio.  
 Perkinson & Brown, Chicago.  
 • Republic Steel Corporation, Cleveland.  
 Southern States Iron Rfg. Co., Savannah, Ga.  
 Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.  
 Wheeling Corrugating Co., Wheeling, W. Va.  
 Wheeling Steel Corp., Wheeling, W. Va.

### ROOFING, ZINC

American Zinc Products Co., Greencastle, Ind.  
 Barnes Metal Products Co., Chicago, Ill.  
 Edwards Mfg. Co., Inc., Cincinnati.  
 Illinois Zinc Co., Peru, Ill.  
 Matthiessen & Hegeler Zinc Co., La Salle, Ill.  
 New Jersey Zinc Co., New York City.  
 Southern States Iron Rfg. Co., Savannah, Ga.  
 Wheeling Corrugating Co., Wheeling, W. Va. (Coated)  
 Wheeling Steel Corp., Wheeling, W. Va. (Coated)

### RUST PROTECTION FOR METALS

*See Chemicals, Rust Preventive*

### SAFETY GLASS

*See Glass, Safety*

### SANDERS

*See Buffers, Grinders, Polishers and Sanders*

### SAVERS, HEAT

Barclay, Inc., Robert, Chicago.  
 Cary Mfg. Co., Waupaca, Wis.  
 • Condensation Engineering Corp., Chicago, Ill.  
 Crown Fuel Saver Co., Richmond, Ind.  
 Gerhardt, W. F., Richmond, Va.  
 Harvey-Whipple, Inc., Springfield, Mass.  
 • Leader Iron Works, Decatur, Ill.  
 Meyers Fuel Saver Co., Inc., Janesville, Wis.  
 Reynolds Electric Co., Chicago.  
 Roberts-Hamilton Co., Minneapolis, Minn.  
 Woolery Machine Co., Minneapolis, Minn.

### SAWS, BAND, SHEET METAL CUTTING

Atkins & Co., E. C., Indianapolis, Ind.  
 Barnes, W. O., Detroit.  
 Continental Machines Incorporated, Minneapolis. (Rotary)  
 Grob Brothers, Grafton, Wis.  
 Diaston & Sons, Inc., Henry, Tacony Sta., Philadelphia.  
 Racine Tool & Machine Co., Racine, Wis.  
 Tannewitz Works, Grand Rapids, Mich.  
 Wells Mfg. Corp., Three Rivers, Mich.

### SAWS, HACK, POWER

Atkins & Co., E. C., Indianapolis, Ind.  
 Champion Blower & Forge Co., Lancaster, Pa.  
 Diaston & Sons, Inc., Henry, Tacony Sta., Philadelphia.  
 Racine Tool & Machine Co., Racine, Wis.  
 • Robertson, F. L., Buffalo.  
 Royersford Foundry & Machine Co., Royersford, Pa.  
 Syntroon Co., Homer City, Pa. (Electric, semi-portable)

### SCREENS, SUN REFLECTING

Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.

### SCREWS, DRIVE

American Screw Co., Providence, R. I.  
 Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.  
 Continental Screw Co., New Bedford, Mass.  
 Corbin Screw Corp., New Britain, Conn.  
 • Deniston Co., Chicago, Ill.  
 Elco Tool & Screw Corporation, Rockford, Ill.  
 Hassall, Inc., John, Brooklyn, N. Y.  
 National Lock Co., Rockford, Ill.  
 National Screw & Mfg. Co., Cleveland, O.  
 • Parker-Kalon Corp., New York City. (Hardened Metallic)  
 Pheoll Manufacturing Co., Chicago.  
 Townsco Co., New Brighton, Pa.  
 Turner & Seymour Mfg. Co., Torrington, Conn.

### SCREWS, FEED, STOKER

Burnside Steel Foundry Co., Chicago.  
 Chicago Steel Foundry Co., Chicago.  
 Davy Fuel & Supply Co., Stoker Div., Detroit.  
 Farrell-Cheek Steel Co., Stoker Parts Div., Sandusky, Ohio.  
 Wyoming Stoker Worm Co., Wyoming, Pa.

### SCREWS, SELF-TAPPING

American Screw Co., Providence, R. I.  
 Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.  
 Continental Screw Co., New Bedford, Mass.  
 Corbin Screw Corporation, New Britain, Conn.  
 Elco Tool & Screw Corporation, Rockford, Ill.  
 National Lock Co., Rockford, Ill.  
 National Screw & Mfg. Co., Cleveland, O.  
 • Parker-Kalon Corp., New York City.  
 Pheoll Manufacturing Co., Chicago.  
 Shakeproof, Inc., Chicago, Ill.  
 • United States Register Co., Battle Creek, Mich.

### SCREWS, SHEET METAL

Aluminum Co. of America, Pittsburgh, Pa. (Aluminum)  
 American Screw Co., Providence, R. I.  
 Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.  
 (Stainless Steel)  
 Continental Screw Co., New Bedford, Mass.  
 Corbin Screw Corporation, New Britain, Conn.  
 Elco Tool & Screw Corporation, Rockford, Ill.  
 National Lock Co., Rockford, Ill.  
 National Screw & Mfg. Co., Cleveland, O.  
 • Parker-Kalon Corp., New York City.  
 Pheoll Manufacturing Co., Chicago.  
 Shakeproof, Inc., Chicago.  
 Townsend Co., New Brighton, Pa.  
 • United States Register Co., Battle Creek, Mich.

### SEAMER MACHINES

*See Machines, Seaming*

### SETTING DOWN MACHINES

*See Machines, Setting Down*

### SHEARS, CIRCLE, HAND

• Crescent Tool Co., Jamestown, N. Y.  
 • Niagara Machine & Tool Works, Buffalo.  
 Peck, Stow & Wilcox Co., Southington, Conn.  
 • Wiss & Sons Co., J., Newark, N. J.

### SHEARS, CIRCLE, POWER

• Niagara Machine & Tool Works, Buffalo, N. Y.  
 Peck, Stow & Wilcox Co., Southington, Conn.  
 Yoder Company, Cleveland.

### SHEARS, HAND AND BENCH

*See Snips and Shears, Bench and Hand*

### SHEARS AND PUNCHES COMBINED

*See Punches and Shears Combined*

### SHEARS, ELECTRIC, PORTABLE

Black & Decker Mfg. Co., Towson, Md.  
 G. D. S. Machinery & Supply Co., New York City.  
 Independent Pneumatic Tool Co., Chicago.  
 O'Neill-Irwin Manufacturing Co., Minneapolis.  
 Quickwork-Whiting Div., Whiting Corp., Harvey, Ill.  
 Skilsaw, Inc., Chicago.  
 • Stanley Electric Tool Div., The Stanley Works, New Britain, Conn.  
 Van Dorn Electric Tool Co., Towson, Md.

### SHEARS, ROTARY, SLITTING, HAND

• Marshalltown Manufacturing Co., Marshalltown, Ia.  
 • Niagara Machine & Tool Works, Buffalo.  
 Peck, Stow & Wilcox Co., Southington, Conn.  
 Rafter Machine Co., Belleville, N. J.  
 Wagner, C. DeWitt, Cedar Rapids, Iowa.

### SHEARS, SQUARING, FOOT

Bertsch & Co., Cambridge City, Ind.  
 • Niagara Machine & Tool Works, Buffalo.  
 Peck, Stow & Wilcox Co., Southington, Conn.  
 Royersford Foundry & Machine Co., Royersford, Pa.

### SHEARS, SQUARING, POWER

Beatty Machine & Mfg. Co., Hammond, Ind.  
 Bertsch & Co., Cambridge City, Ind.  
 Bliss & Co., E. W., Toledo, Ohio.  
 Cincinnati Shaper Co., Cincinnati, O.  
 Cleveland Punch & Shear Works Co., Cleveland.  
 Excelsior Tool and Machine Co., East St. Louis, Ill.  
 • Niagara Machine & Tool Works, Buffalo.  
 Peck, Stow & Wilcox Co., Southington, Conn.  
 Streine Tool & Mfg. Co., New Bremen, Ohio.  
 • Whitney Metal Tool Company, Rockford, Ill.

## SHEET METAL PARTS

*See Mouldings and Trim; also Stampings, Metal*

## SHEETS, ALUMINUM

Aluminum Company of America, Pittsburgh, Pa.  
American Nickeloid Company, Peru, Ill.  
Fairmont Aluminum Co., Fairmont, W. Va.

## SHEETS, CLAD

Allegheny Ludlum Steel Corp., Pittsburgh.  
Aluminum Company of America, Pittsburgh.  
General Plate, Div. Metals & Controls Corp., Attleboro, Mass.  
Ingersoll Steel & Disc Div. Borg-Warner Corp., Chicago.  
Jessop Steel Co., Washington, Pa. (Stainless)  
Lukens Steel Co., Coatesville, Pa.

## SHEETS, COPPER

- American Brass Co., Waterbury, Conn.
- American Nickeloid Co., Peru, Ill.
- Bridgeport Brass Co., Bridgeport, Conn.
- Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
- Conklin Brass & Copper Co., Inc., T. E., New York City.
- Downs-Smith Brass & Copper Co., Inc., New York City.
- Hussey & Co., C. G., Pittsburgh, Pa.
- National Brass & Copper Co., Inc., Lisbon, O.
- New Haven Copper Co., Seymour, Conn.
- Revere Copper and Brass Incorporated, New York City.
- U. S. Brass & Copper Co., Hyde Park, Mass.

## SHEETS, COPPER, LEAD COATED

- American Brass Co., Waterbury, Conn.
- Bridgeport Brass Co., Bridgeport, Conn.
- Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
- Downs-Smith Brass & Copper Co., New York City.
- Hussey & Co., C. G., Pittsburgh, Pa.
- Lamb & Ritchie Co., Cambridge, Mass.
- Ledkote Products Co., Long Island City, N. Y.
- National Brass & Copper Co., Inc., Lisbon, O.
- New Haven Copper Co., Seymour, Conn.
- Revere Copper & Brass Incorporated, New York City.
- U. S. Brass & Copper Co., Hyde Park, Mass.

## SHEETS, GALVANNEALED

- Carnegie-Illinois Steel Corp., Pittsburgh, Pa.
- Continental Steel Corp., Kokomo, Ind.
- Granite City Steel Co., Granite City, Ill.
- Newport Rolling Mill Co., Newport, Ky.
- Republic Steel Corp., Cleveland, O.
- Sharon Steel Corp., Sharon, Pa.
- Superior Sheet Steel Co., Canton, O.
- Youngstown Sheet & Tube Co., Youngstown, O.

## SHEETS, LEAD

Alpha Metal & Rolling Mills, Inc., Brooklyn.  
American Smelting and Refining Co., New York City  
Andrews Lead Co., Inc., Long Island City, N. Y.  
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.  
Eagle-Picher Lead Co., Cincinnati, O.  
Flemm Lead Co., Inc., Long Island City, N. Y.  
Lissberger & Son, Inc., Marks, Long Island City, N. Y.  
National Lead Co., New York City.  
Northwest Lead Company, Seattle, Wash.  
Revere Copper and Brass Incorporated, New York City.  
Rochester Lead Works, Rochester, N. Y.  
Standard Rolling Mills, Inc., Brooklyn, N. Y.

## SHEETS, MONEL

International Nickel Company, Inc., New York City.

## SHEETS, SPECIAL METAL

(Nickel Zinc, Chrome Zinc, Nickel Coated Copper, Chromium Coated Copper, Nickel Coated Steel, Chromium Coated Steel, Chromium Coated Nickel Silver, Zinc Brass, Zinc Copper, etc.)

- Allegheny Ludlum Steel Corp., Pittsburgh.
- American Brass Co., Waterbury, Conn. (Copper-Silicon Alloys)
- American Nickeloid Co., Peru, Ill.
- Apollo Metal Works, Chicago. (Nickel Zinc, Chrom Zinc, Nickel Copper, Chrom Copper, Chrom Steel, Nickel Steel, Nickel Tin, Chrom Tin)
- Apollo Steel Co., Apollo, Pa.
- Bethlehem Steel Co., Bethlehem, Pa.
- Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
- Hussey & Co., C. G., Pittsburgh, Pa.
- Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago, Ill.
- Lukens Steel Co., Coatesville, Pa.
- Lustrco Coated Sheets Co., Pittsburgh, Pa.
- Lyon, Conklin & Co., Inc., Baltimore, Md.
- Maysteel Products, Inc., Mayville, Wis.
- National Sheet Metal Co., Peru, Ill.
- Republic Steel Corporation, Cleveland.
- Wilder Manufacturing Company, Niles, O.

## SHEETS, STAINLESS

- Allegheny Ludlum Steel Corp., Pittsburgh.
- American Rolling Mill Co., Middletown, Ohio.
- Barlum Stainless Steel Corp., Canton, O.

Carnegie-Illinois Steel Corp., Pittsburgh, Pa.  
Colonial Alloys Co., Philadelphia.  
Crucible Steel Co. of America, New York City. (Two-Ply)  
Ingersoll Steel & Disc Div. Borg-Warner Corp., Chicago, Ill.  
Jessop Steel Co., Washington, Pa.  
Lukens Steel Company, Coatesville, Pa.  
• Republic Steel Corp., Cleveland, O.  
• Ryerson & Son, Inc., Jos. T., Chicago, Ill.  
Sharon Steel Corp., Sharon, Pa.  
Superior Steel Corp., Pittsburgh, Pa.  
Universal-Cyclops Steel Corp., Bridgeville, Pa.

## SHEETS, STEEL

(Polished and Blue, Corrugated and Plain, Black, Terne and Galvanized)

- American Rolling Mill Co., Middletown, O.
- Apollo Steel Co., Apollo, Pa.
- Bethlehem Steel Co., Bethlehem, Pa.
- Carnegie-Illinois Steel Corp., Pittsburgh, Pa.
- Columbia Steel Co., San Francisco, Cal.
- Continental Steel Corp., Kokomo, Ind.
- Crucible Steel Company of America, New York City.
- Empire Sheet & Tin Plate Co., Mansfield, O.
- Granite City Steel Co., Granite City, Ill.
- Great Lakes Steel Corporation, Detroit.
- Inland Steel Co., Chicago, Ill.
- Jones & Laughlin Steel Corp., Pittsburgh, Pa.
- Lukens Steel Co., Coatesville, Pa.
- Lyon, Conklin & Co., Inc., Baltimore, Md.
- Newport Rolling Mill Co., Newport, Ky.
- Niles Rolling Mill Co., Niles, O.
- Parkersburg Iron & Steel Co., Parkersburg, W. Va.
- Reeves Steel & Mfg. Co., Dover, O.
- Republic Steel Corp., Cleveland, Ohio.
- Sharon Steel Co., Sharon, Pa.
- Superior Sheet Steel Co., Canton, O. (Galvanized)
- Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
- Weirton Steel Co., Weirton, W. Va.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Wheeling Steel Corp., Wheeling, W. Va.
- Youngstown Sheet & Tube Co., Youngstown, O.

## SHEETS, STEEL, COPPER BEARING

- American Rolling Mill Co., Middletown, O.
- Bethlehem Steel Co., Bethlehem, Pa.
- Carnegie-Illinois Steel Corp., Pittsburgh, Pa.
- Columbia Steel Co., San Francisco, Cal.
- Continental Steel Corp., Kokomo, Ind.
- Follansbee Steel Corporation, Pittsburgh, Pa.
- Granite City Steel Co., Granite City, Ill.
- Inland Steel Co., Chicago, Ill.
- Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
- Lukens Steel Co., Coatesville, Pa.
- Newport Rolling Mill Co., Newport, Ky.
- Reeves Mfg. Co., Dover, O.
- Republic Steel Corp., Cleveland, O.
- Sharon Steel Co., Sharon, Pa.
- Superior Sheet Steel Co., Canton, O.
- Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
- Weirton Steel Co., Weirton, W. Va.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Wheeling Steel Corp., Wheeling, W. Va.
- Youngstown Sheet & Tube Co., Youngstown, O.

## SHEETS, TIN PLATE

- Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
- Bethlehem Steel Co., Bethlehem, Pa.
- Carnegie-Illinois Steel Corp., Pittsburgh, Pa.
- Columbia Steel Co., Sub. U. S. Steel Corp., San Francisco.
- Crucible Steel Company of America, New York City.
- Follansbee Steel Corporation, Pittsburgh, Pa.
- Granite City Steel Co., Granite City, Ill.
- Inland Steel Co., Chicago, Ill.
- Jones & Laughlin Steel Corp., Pittsburgh, Pa. (Tinned)
- Lyon, Conklin & Co., Inc., Baltimore, Md.
- Republic Steel Corporation, Cleveland.
- Rochester Lead Works, Inc., Rochester, N. Y.
- Sharon Steel Corp., Sharon, Pa.
- Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
- Weirton Steel Co., Weirton, W. Va.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Wheeling Steel Corp., Wheeling, W. Va.
- Youngstown Sheet & Tube Co., Youngstown, O.

## SHEETS, ZINC

American Nickeloid Co., Peru, Ill.  
American Zinc Products Co., Greencastle, Ind.  
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.  
Hegeler Zinc Co., Danville, Ill.  
Illinois Zinc Co., Peru, Ill.  
Matthiessen & Hegeler Zinc Co., La Salle, Ill.  
New Jersey Zinc Co., New York City.

## SHIELDS, WARM AIR REGISTER

- Gammeter Co., W. F., Cadiz, O. (With Humidifier)
- Gilliam Mfg. Co., Detroit.
- Kauffman Air Conditioning Corp., St. Louis, Mo.
- Marshall Mfg. Co., Cleveland.
- Patent Novelty Co., Fulton, Ill. (With Humidifier)



Pentecost & Craft Co., Terre Haute, Ind.  
 Schoedinger, F. O., Co., Columbus, O.  
 Swing-A-Way Steel Products, Inc., Chicago (with filter).

### SHINGLES AND TILE, METAL

- Ames Company, W. R., San Francisco.  
 ● Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.  
 Columbian Enameling & Stamping Co., Terre Haute, Ind.  
 Edwards Manufacturing Co., Inc., Cincinnati, O.  
 Fingles Co., The, Baltimore, Md.  
 Globe Iron Roofing & Corrugating Co., Newport, Ky. (galvanized and paintedterne)  
 Herbert & Sons, T. L., Nashville, Tenn.  
 ● Milcor Steel Co., Milwaukee, Wis.  
 Miller & Doing, Inc., Brooklyn, N. Y.  
 New Haven Copper Co., Seymour, Conn. (Copper)  
 Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.  
 Reeves Steel & Mfg. Co., Dover, O.  
 Sheet Metal Mfg. Co., Inc., Brooklyn.  
 Southern States Iron Roofing Co., Savannah, Ga.  
 Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. (Galv. Steel)  
 Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.  
 Wheeling Corrugating Co., Wheeling, W. Va.  
 Williams-Wallace Co., San Francisco, Cal. (Painted tin and galv.)

### SHRINKING MACHINES

*See Machines, Shrinking*

### SHUTTERS

*See Louvers and Shutters*

### SHUTTERS & DOORS, FIRE

*See Doors and Shutters, Fire*

### SKYLIGHT LIFTS

*See Lifts, Skylight*

### SKYLIGHTS

- Acme Tin Plate & Roofing Supply Co., Philadelphia, Pa.  
 American Sheet Metal Works, New Orleans, La.  
 Anderson Mfg. Co., Des Moines, Ia.  
 Beatrice Steel Tank Mfg. Co., Beatrice, Nebr.  
 Biersach & Niedermeyer Co., Milwaukee, Wis.  
 ● Brundage Co., Kalamazoo, Mich.  
 California Cornice, Steel and Supply Corp., Los Angeles, Cal.  
 Chicago Metal Mfg. Co., Chicago, Ill.  
 ● Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.  
 Edwards Mfg. Co., Inc., Cincinnati, O.  
 Falstrom Co., Passaic, N. J.  
 Fingles Co., The, Baltimore, Md.  
 Goethel Co., Alfred C., Milwaukee, Wis.  
 Herbert & Sons, T. L., Nashville, Tenn.  
 Hirschman Co., Inc., W. F., Buffalo, N. Y.  
 International Steel Co., Evansville, Ind.  
 Klauer Mfg. Co., Dubuque, Ia.  
 Lee & Son Co., Thomas, Cincinnati, O.  
 Main Cornice Works, Los Angeles, Cal.  
 Martin Metal Mfg. Co., Wichita, Kan.  
 Mesker & Co., Geo. L., Evansville, Ind.  
 Midwest Aluminum Products, Inc., Milwaukee.  
 ● Milcor Steel Co., Milwaukee, Wis.  
 Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.  
 Northern Furnace & Supply Co., Billings, Mont.  
 ● Perkinson & Brown, Chicago.  
 Riester & Thesmacher Co., Cleveland.  
 Robertson Co., H. H., Pittsburgh, Pa.  
 Rynker Sheet Metal Works, Inc., Billings, Mont.  
 St. Paul Corrugating Co., St. Paul, Minn.  
 Schoedinger, F. O., Co., Columbus, O.  
 Southbridge Roofing Co., Inc., Southbridge, Mass.  
 Steinhorst & Sons, Inc., Emil, Utica, N. Y.  
 Van Noorden Co., E., Boston, Mass.  
 Vent-O-Lite Co., Chicago. (Ventilating, Industrial, Putty-less)  
 Ward Co., H. H., Chester, Pa.  
 ● Willis Steel Corporation, Galesburg, Ill.  
 York Corrugating Co., York, Pa.

### SLEEVE BEARINGS

*See Bearings, Sleeve*

### SLITTING MACHINES

*See Machines, Slitting*

### SMOKE PIPE

*See Pipe, Smoke*

### SNIPS AND SHEARS, BENCH AND HAND

- Armstrong-Blum Mfg. Co., Chicago, Ill.  
 Bartlett Mfg. Co., Detroit, Mich.  
 Beverly Throatless Shear Co., Chicago, Ill.  
 ● Bremil Mfg. Co., Erie, Pa. (Shears)  
 Class Shear Co., Fremont, O. (hand)  
 Compton Shear Co., W. H., Newark, N. J.  
 ● Crescent Tool Co., Jamestown, N. Y.

- G. D. S. Machinery & Supply Co., New York City.  
 Grobet File Corp. of America, New York City.  
 Klenk's Aviation Snips, Wilmington, Del.  
 ● Marshalltown Mfg. Co., Marshalltown, Ia.  
 ● Niagara Machine & Tool Works, Buffalo, N. Y.  
 Peck, Stow & Wilcox Co., Southington, Conn.  
 Packham Crimper Company, Mechanicsburg, Ohio (Rotary Snips)  
 Penn Tool Company, Philadelphia.  
 ● Reiner & Campbell Co., Inc., Elizabeth, N. J.  
 St. Louis Tool Co., St. Louis.  
 Viking Shear Co., Erie, Pa. (Shears)  
 ● Wiss & Sons Co., J., Newark, N. J.

### SNOW GUARDS

*See Guards, Snow*

### SOLDER

- Allen Co., L. B., Chicago, Ill. (Aluminum and Stainless Steel)  
 Alpha Metal & Rolling Mills, Inc., Brooklyn.  
 ● American Brass Co., Waterbury, Conn.  
 American Solder & Flux Co., Philadelphia, Pa. (paste)  
 Andrews Lead Co., Inc., Long Island City, N. Y.  
 Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y. (all kinds)  
 Chase Brass & Copper Co., Incorporated, Waterbury, Conn.  
 Conklin Brass & Copper Co., Inc., T. E., New York City  
 Downs-Smith Brass & Copper Co., New York City.  
 Eagle-Picher Co., Cincinnati, O. (Bar and Wire)  
 Empire Metal Co., Syracuse, N. Y.  
 Flemm Lead Co., Inc., Long Island City.  
 Gardiner Metal Co., Chicago, Ill.  
 Glaser Lead Co., Inc., Brooklyn, N. Y.  
 Handy & Harman, New York City. (silver)  
 Imperial Brass Mfg. Co., Chicago, Ill.  
 Johnson Co., Lloyd S., Chicago.  
 Johnston Tin Foil & Metal Co., St. Louis, Mo.  
 Kester Solder Co., Chicago, Ill.  
 Klauer Mfg. Co., Dubuque, Ia.  
 Lenk Mfg. Company, Newton Lower Falls, Mass.  
 Lissberger & Son, Inc., Marks, Long Island City, N. Y.  
 Lukens Metal Co., Thos. F., Philadelphia, Pa.  
 McNamee Products, Glencoe, Ill.  
 Merchant & Evans Co., Philadelphia, Pa.  
 Motex Metal Process Corporation, Detroit.  
 National Lead Co., New York City.  
 New Delphos Manufacturing Co., Delphos, Ohio.  
 Northwest Lead Company, Seattle, Wash.  
 ● Ruby Chemical Co., Columbus, O. (Acid and Rosin Core)  
 ● Ryerson & Son, Inc., Joseph T., Chicago, Ill.  
 Sheet Metal Mfg. Co., Inc., Brooklyn.  
 Standard Rolling Mills, Inc., Brooklyn, N. Y.

### SOLDERING COPPERS

*See Coppers, Soldering*

### SOLDERING FLUX

*See Flux, Soldering*

### SOLDERING FURNACES

*See Furnaces, Soldering*

### SOLDERING IRONS

*See Coppers, Soldering*

### SOLDERING TORCHES

*See Torches, Soldering*

### SOLENOID VALVES

*See Valves, Solenoid*

### SOUND LEVEL INDICATORS

*See Indicators, Sound Level*

### SPOT WELDERS

*See Welders, Spot*

### SPRAY GUNS

*See Guns, Spray*

### SQUARING MACHINES

*See Machines, Squaring*

### STAMPINGS, METAL

- Ackermann Manufacturing Company, Wheeling, W. Va.  
 Ames Co., W. R., San Francisco.  
 Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.  
 Bossert Company, Inc., Utica, N. Y.  
 Bridgeport Brass Co., Bridgeport, Conn.  
 Chase Brass & Copper Co., Incorporated, Waterbury, Conn.  
 Cleveland Steel Products Corp., Toridheet Div., Cleveland.  
 Commercial Shearing & Stamping Co., Youngstown, O.  
 Continental Machines Incorporated, Minneapolis.  
 Dayton Rogers Mfg. Co., Minneapolis, Minn.  
 Edwards Mfg. Co., Inc., Cincinnati.

Friedley-Voshardt Co., Chicago, Ill.  
 General Blower Corp., San Francisco.  
 General Metal Products Co., St. Louis, Mo.  
 Geuder, Paeschke & Frey Co., Milwaukee, Wis.  
 Gillian Mfg. Co., Detroit.  
 Globe Machine & Stamping Co., Cleveland, O.  
 Grammes & Sons, Inc., L. F., Allentown, Pa.  
 H P L Manufacturing Co., Cleveland.  
 Kirk & Blum Mfg. Co., Cincinnati, O.  
 Maysteel Products, Inc., Mayville, Wis.  
 Morrison Products, Inc., Cleveland.  
 ●Morrison Steel Products, Inc., Buffalo, N. Y.  
 Mullins Mfg. Co., Warren, O.  
 National Manufacturing & Engineering Co., Detroit.  
 New Delphos Manufacturing Co., Delphos, Ohio.  
 New Monarch Machine & Stamping Co., Des Moines, Ia.  
 Niles Steel Products Div., Republic Steel Corp., Niles, O.  
 ●Osborn Co., J. M. & L. A., Cleveland, O.  
 Standard Pressed Steel Co., Jenkintown, Pa.  
 ●Standard Stamping & Perforating Co., Chicago, Ill.  
 Tannewitz Works, Grand Rapids, Mich.  
 Worcester Pressed Steel Co., Worcester, Mass.

### STAMPINGS, STEEL FURNACE

- Ackermann Manufacturing Company, Wheeling, W. Va.  
 Commercial Shearing & Stamping Co., Youngstown, O.  
 (Flanged and Dished Heads for Furnace Domes, Radiator Crescent Heads, Hat Pipes)

### STEEL FRAMING

*See Framing, for Housing Assemblies*

### STOKER CONTROLS

*See Controls, Stoker*

### STOKER DRIVES

*See Drives, Stoker*

### STOKER SCREWS OR WORKS

*See Screws, Feed, Stoker*

### STOKERS, DOMESTIC

(Up to 61 lb. per hr.)

- Advance Appliance Co., Peoria, Ill.
- Air Conditioning & Stokers, Inc., St. Louis.
- American Furnace Co., St. Louis.
- Anchor Stove & Range Co., New Albany, Ind.
- Auburn Foundry, Inc., Stoker Div., Auburn, Ind.
- Auburn Stoker Co., Auburn, Ind.
- Automatic Stoker Corp., Indianapolis, Ind.
- Bardes Range & Foundry Co., E. H., Cincinnati, O.
- Beckley Perforating Co., Garwood, N. J. (Anthracite)
- Black Servant Stoker Co., St. Louis.
- Bluffton Mfg. Co., Findlay, O.
- Bovee Furnace Works, Waterloo, Ia.
- Bros Boller & Mfg. Co., Wm., Minneapolis, Minn.
- Brownie Stoker Co., Decatur, Ill.
- Brownell Co., Dayton, O.
- Bryant Heater Co., Cleveland. (Coke)
- Burnham Stoker Co., Vancouver, Wash.
- Burnwell Corp., Allentown, Pa.
- Butler Street Foundry & Iron Co., Chicago, Ill.
- Canton Stoker Corporation, Canton, Ohio.
- Carpenter Heating & Stoker Company, Cleveland.
- Carrier Corp., Syracuse, N. Y.
- Chicago Automatic Stoker Co., Inc., Chicago, Ill.
- Coal-O-Matic Stoker Company, Trucksville, Pa. (Anthracite)
- Conco Corporation, Mendota, Ill.
- Cooper & Cooper, Inc., Pittsfield, Mass. (Anthracite)
- Crane Co., Chicago. (Bituminous & Anthracite)
- Crouch Corporation, Birmingham, Mich.
- Davy Fuel & Supply Co., Stoker Div., Detroit. (Bituminous)
- Delco Appliance Div., General Motors Sales Corp., Rochester, N. Y.
- Dickson Coal Co., New York City.
- Dowagiac Steel Furnace Co., Dowagiac, Mich.
- Econ-O-Col Stoker Div. of Cotta Transmission Corp., Rockford, Ill.
- Eddy Stoker Corp., Chicago, Ill.
- Electric Furnace-Man, Inc., New York City.
- Fairbanks, Morse & Co., Chicago, Ill.
- Finnell Rotary Stokers, Inc., Elkhart, Ind.
- Foy Stoker Mfg. Co., Chicago.
- Freed Heater & Stoker Company, Collegeville, Pa. (Anthracite)
- Frederick Iron & Steel Co., Frederick, Md.
- Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
- Fuel Savers, Inc., Harrisburg, Pa.
- Furnaceslave, Inc., Indianapolis, Ind.
- Gehl Bros., Inc., West Bend, Wis.
- General Machine Co., Inc., Emmaus, Pa.
- General Stokers, Inc., Philadelphia. (Anthracite)
- Green Colonial Furnace Co., Des Moines, Ia.
- Grossenbacher Furnace Co., St. Louis.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Hamilton Automatic Stoker Corp., Hamilton, O.
- Heating Assurance, Spokane, Wash.

- Hemp Co., Macomb, Ill.
- Heritage Stoker Sales, Inc., Chicago, Ill.
- Hess Warming and Ventilating Co., Chicago, Ill.
- Holcomb & Hoke Mfg. Co., Indianapolis, Ind.
- Homer Furnace & Foundry Corp., Coldwater, Mich.
- Ideal Furnace Co., Detroit.
- Illinois Iron & Bolt Co., Chicago, Ill.
- Iron Fireman Mfg. Co., Cleveland, O.
- Jacobson Machine Works, Inc., A. E., Minneapolis, Minn.
- Keith Furnace Co., Des Moines, Ia.
- Kingston Products Corporation, Kokomo, Ind.
- Kol-Master Corp., Oregon, Ill.
- Leach Co., Oshkosh, Wis.
- Link-Belt Co., Chicago, Ill.
- McLouth Air Conditioning Corp., Lansing, Mich.
- Malco Gear Co., Dolton, Ill.
- Meyer Furnace Co., Peoria, Ill.
- ModernAire Co., Div. Des Moines Stove Repair Co., Des Moines, Ia.
- Motorstokor Div. of Hershey Machine & Foundry Co., Mannheim, Pa.
- Muncie Gear Works, Inc., Muncie, Ind.
- Murray Corporation of America, Detroit.
- National Steam Pump Co., Upper Sandusky, O.
- National Stoker Factory Sales Co., St. Louis.
- Northern Steel & Stoker Corp., Peoria, Ill.
- Palmer Mfg. Co., Cleveland.
- Peerless Mfg. Co., Louisville, Ky.
- Plymouth Industries, Inc., Plymouth, Ind.
- Pocahontas Fuel Co., Inc., Stoker Div., Cleveland.
- Racine Stoker Mfg. Co., Racine, Wis.
- Round Oak Co., Dowagiac, Mich.
- Rudy Furnace Co., Dowagiac, Mich.
- Schwab Furnace Co., Milwaukee, Wis.
- Schwab Safe Co., Lafayette, Ind.
- Schwitzer-Cummins Co., Indianapolis, Ind.
- Scott Engineering Co., Noblesville, Ind.
- Scott-Newcomb, Inc., St. Louis, Mo.
- Sinker-Davis Co., Indianapolis, Ind.
- Souther Iron Co., E. E., St. Louis.
- Standard Stoker Corporation, New Albany, Ind.
- Steel Products Engineering Co., Springfield, O.
- Stok-A-Fire Co., Inc., University City, Mo.
- Stokerette Mfg. Co., Chicago, Ill.
- Stoker-Lad, Inc., Tacoma, Wash.
- Stokermatic Co., Salt Lake City, Utah.
- Stoker Products, Inc., Decatur, Ill.
- Susquehanna Engineering Co., Bloomsburg, Pa.
- Toledo Stoker Co., Toledo, O.
- Tropic-Air Stoker Co., New London, O.
- U. S. Machine Corporation, Lebanon, Ind.
- Will-Burt Co., Orrville, O.
- York Ice Machinery Corporation, York, Pa.

### STOKERS, INDUSTRIAL AND COMMERCIAL

(61 lb. to 300 lb. per hr.)

- American Coal Burner Co., Chicago, Ill.
- American Engineering Co., Philadelphia.
- Anchor Stove & Range Co., New Albany, Ind.
- Auburn Burner Co., Auburn, Ind.
- Auburn Foundry, Inc., Stoker Div., Auburn, Ind.
- Automatic Stoker Corp., Milwaukee.
- Babcock & Wilcox Co., New York City.
- Bluffton Mfg. Co., Findlay, O.
- Bros Boller & Mfg. Co., Wm., Minneapolis, Minn.
- Brownell Co., Dayton, O.
- Burke Stoker & Mfg. Co., Chicago.
- Burnham Stoker Co., Vancouver, Wash.
- Butler Street Foundry & Iron Co., Chicago, Ill.
- Canton Stoker Corp., Canton, O.
- Carpenter Heating & Stoker Company, Cleveland.
- Chicago Automatic Stoker Co., Inc., Chicago, Ill.
- Chicago Hardware Foundry Co., North Chicago, Ill.
- Coal-O-Matic Stoker Co., Trucksville, Pa. (Anthracite)
- Conco Corporation, Mendota, Ill.
- Crown Iron Works, Minneapolis, Minn.
- Detroit Stoker Co., Detroit and Monroe, Mich.
- Diamond Castings Co., Johnsonburg, Pa.
- Econ-O-Col Stoker Div. of Cotta Transmission Corp., Rockford, Ill.
- Eddy Stoker Corp., Chicago, Ill.
- Electric Furnace-Man, Inc., New York City.
- Fairbanks, Morse & Co., Chicago, Ill.
- Firewood Machine Wks., Converse, Ind.
- Flynn & Emrich Co., Baltimore, Md.
- Frederick Iron & Steel Co., Frederick, Md.
- Front Rank Furnace Div., Liberty Foundry Co., St. Louis.
- Fuel Savers Inc., Harrisburg, Pa.
- Gehl Bros. Mfg. Co., West Bend, Wis.
- General Machinery Co., Spokane, Wash.
- Grand Rapids Blow Pipe and Dust Arrester Co., Grand Rapids, Mich.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Hamilton Automatic Stoker Corp., Hamilton, O.
- Hare Stoker Corp., Detroit, Mich.
- Heating Assurance, Spokane, Wash.
- Hemp Co., Macomb, Ill.
- Heritage Stoker Sales, Inc., Chicago, Ill.
- Hoffman Combustion Eng. Co., Detroit.
- Holcomb & Hoke Mfg. Co., Indianapolis, Ind.

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Illinois Iron & Bolt Co., Chicago, Ill.  
 International Engineering Wks., Inc., Framingham, Mass.  
 Iron Fireman Mfg. Co., Cleveland, O.  
 Jacobson Machine Works, Inc., A. E., Minneapolis, Minn.  
 Kingston Products Corporation, Kokomo, Ind.  
 Kol-Master Corp., Oregon, Ill.  
 Leach Co., Oshkosh, Wis.  
 Leffel & Co., James, Springfield, O.  
 Link-Belt Co., Chicago, Ill.  
 McLouth Air Conditioning Corp., Lansing, Mich.  
 Mallory Sales Co., Dolton, Ill.  
 Marion Machine, Foundry & Supply Co., Marion, Ind.  
 Mesker & Co., Geo. L., Evansville, Ind.  
 • Meyer Furnace Co., Peoria, Ill.  
 ModernAire Co. Div. Des Moines Stove Repair Co., Des Moines, Ia.  
 Motorstokor Div. of Hershey Machine & Foundry Co., Manheim, Pa.  
 Muncie Gear Works, Inc., Muncie, Ind.  
 National Steam Pump Co., Upper Sandusky, O.  
 Neemes Foundry Inc., Troy, N. Y.  
 Northern Steel & Stoker Corp., Peoria, Ill.  
 Ormsby-Osterman Co., St. Louis, Mo.  
 Over-Spred Stoker Co., Ottawa, Ill.  
 Patterson Foundry & Machine Co., East Liverpool, O.  
 Peabody Engineering Corp., New York City.  
 Perfection Grate & Stoker Co., Springfield, Mass.  
 Plymouth Industries, Inc., Plymouth, Ind.  
 Pocahontas Fuel Co., Inc., Cleveland.  
 Racine Stoker Mfg. Co., Racine, Wis.  
 Riley Stoker Corp., Worcester, Mass.  
 Rosedale Fdry. & Mach. Co., N. S., Pittsburgh, Pa.  
 Rudy Furnace Co., Dowagiac, Mich.  
 Schwab Safe Co., Lafayette, Ind.  
 • Schwitzer-Cummins Co., Indianapolis, Ind.  
 Sinkers-Davis Co., Indianapolis, Ind.  
 Standard Stoker Corporation, New Albany, Ind.  
 Steel Products Engineering Co., Springfield, O.  
 Stok-A-Fire Co., Inc., University City, Mo.  
 Stokermatic Co., Salt Lake City, Utah.  
 Stoker Products, Inc., Decatur, Ill.  
 Susquehanna Engineering Co., Bloomsburg, Pa.  
 Taylor Engineering Co., Cincinnati, O.  
 Tropic-Air Stoker Co., New London, O.  
 U. S. Machine Corporation, Lebanon, Ind.  
 Wayne Oil Burner Corp., Fort Wayne, Ind.  
 Will-Burt Co., Orrville, O.  
 York Ice Machinery Corporation, York, Pa.

## STOVES

*See Heaters*

## STRAINERS, CONDUCTOR

*See Fittings and Accessories, Conductor*

## STRAPS, LEADER

*See Fittings and Accessories, Conductor*

## SWITCHES, MAGNETIC

Allen-Bradley Co., Milwaukee, Wis.  
 Arrow-Hart & Hegeman Electric Co., Hartford, Conn.  
 Automatic Switch Co., New York City.  
 Barber-Colman Company, Rockford, Ill.  
 Bender Warrick Corp., Birmingham, Mich.  
 Clark Controller Co., Cleveland.  
 • Cook Electric Co., Chicago, Ill.  
 Cutler-Hammer, Inc., Milwaukee, Wis.  
 • Detroit Lubricator Co., Detroit, Mich.  
 Dunn Inc., Struthers, Philadelphia, Pa.  
 Electric Controller & Mfg. Co., Cleveland, O.  
 • General Controls Co., Glendale, Cal.  
 General Electric Co., Schenectady, N. Y.  
 Guardian Electric Mfg. Co., Chicago, Ill.  
 H-B Instrument Co., Inc., Philadelphia, Pa.  
 Hart Mfg. Co., Hartford, Conn. (Mercury Tube)  
 Industrial Engineering Corp., Terre Haute, Ind.  
 Jefferson Electric Co., Bellwood, Ill.  
 • McDonnell & Miller, Chicago.  
 • Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.  
 Monitor Controller Co., Baltimore, Md.  
 Palmer Electric Co., Chicago.  
 Paragon Electric Co., Chicago.  
 • Penn Electric Switch Co., Goshen, Ind.  
 • Perfex Corp., Milwaukee, Wis.  
 Square D Co., Detroit, Mich.  
 Tork Clock Co., Inc., Mt. Vernon, N. Y.  
 Trumbull Electric Mfg. Co., Plainville, Conn.  
 Ward Leonard Electric Co., Mt. Vernon, N. Y.  
 Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.  
 • White-Rodgers Electric Co., St. Louis, Mo.  
 Zenith Electric Co., Chicago.

## SWITCHES, MANUAL

Allen-Bradley Co., Milwaukee, Wis.  
 Arrow-Hart & Hegeman Electric Co., Hartford, Conn.  
 Barber-Colman Co., Rockford, Ill.  
 Bender Warrick Corp., Birmingham, Mich.  
 Cutler-Hammer, Inc., Milwaukee, Wis.  
 Dual Remote Control Co., Wayne, Mich.

Durakool, Inc., Elkhart, Ind. (Mercury)  
 Electric Controller & Mfg. Co., Cleveland, O.  
 • General Controls Co., Glendale, Cal.  
 General Electric Co., Schenectady, N. Y.  
 Industrial Engineering Corp., Terre Haute, Ind.  
 Square D Co., Detroit, Mich.  
 Trumbull Electric Mfg. Co., Plainville, Conn.  
 Ward Leonard Electric Co., Mount Vernon, N. Y.  
 Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

## SWITCHES, TIME

Au-Temp-Co. Corp., New York City.  
 Automatic Temperature Control Co., Inc., Philadelphia.  
 Barber-Colman Co., Rockford, Ill.  
 Clark Cooper Co., Palmyra, N. J.  
 Cramer Company, Inc., R. W., Centerbrook, Conn.  
 • Detroit Lubricator Co., Detroit.  
 Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.  
 • General Controls Co., Glendale, Cal.  
 General Electric Co., Schenectady, N. Y.  
 Gleason-Avery, Inc., Auburn, N. Y.  
 Guardian Electric Mfg. Co., Chicago, Ill.  
 Industrial Engineering Corp., Terre Haute, Ind.  
 International Register Co., Chicago.  
 • Merco Corp., Chicago, Ill.  
 • Minneapolis-Honeywell Regulator Co., Minneapolis.  
 National Time & Signal Corp., Detroit.  
 Paragon Electric Co., Chicago, Ill.  
 • Penn Electric Switch Co., Goshen, Ind.  
 • Perfex Corp., Milwaukee, Wis.  
 Reliance Automatic Lighting Co., Racine, Wis.  
 Rhodes, Inc., M. H., Hartford, Conn.  
 Sampsel Time Control, Inc., Spring Valley, Ill.  
 Sangamo Electric Co., Springfield, Ill.  
 Spencer Thermostat Co., Attleboro, Mass.  
 Tork Clock Co., Inc., Mt. Vernon, N. Y.  
 Ward Leonard Electric Co., Mt. Vernon, N. Y.  
 • White-Rodgers Electric Co., St. Louis.  
 Zenith Electric Company, Chicago.

## TEES, FURNACE PIPE

*See Fittings and Accessories, Furnace Pipe*

## TEMPERATURE CONTROLS

*See Thermostats*

## TEMPERATURE RECORDERS

*See Recorders, Temperature*

## TINNING

*See Baths, Tinning*

## TINPLATE

*See Sheets, Tin*

## TIPS, DAMPER

*See Clips and Tips, Damper*

## THERMOMETERS, INDICATING

American Schaeffer & Budenberg Instrument Div., Manning, Maxwell & Moore, Inc., Bridgeport, Conn.  
 Bacharach Industrial Instrument Co., Pittsburgh, Pa.  
 Barclay, Inc., Robert, Chicago, Ill. (Flue Gas)  
 Bristol Co., Waterbury, Conn.  
 Brown Instrument Co., Div. of Minneapolis-Honeywell Reg. Co., Philadelphia, Pa.  
 Builders-Providence, Inc., Providence, R. I.  
 Cooper Oven Thermometer Co., Pequabuck, Conn.  
 Defender Automatic Regulator Co., St. Louis.  
 Dickson Co., Chicago.  
 Fee & Stemwedel, Inc., Chicago.  
 Foxboro Co., Foxboro, Mass.  
 G. M. Mfg. Co., New York City.  
 H-B Instrument Co., Inc., Philadelphia, Pa.  
 • Illinois Testing Laboratories, Inc., Chicago, Ill.  
 Leeds & Northrup Co., Philadelphia, Pa.  
 Marsh Corporation, Jas. P., Chicago.  
 Mason-Neilan Regulator Co., Chicago.  
 • Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.  
 Moeller Instrument Co., Richmond Hill, New York City.  
 Palmer Co., Cincinnati.  
 Precision Thermometer & Instrument Co., Philadelphia, Pa.  
 Preferred Utilities Mfg. Corp., New York City.  
 Rochester Mfg. Co., Rochester, N. Y.  
 Sarco Company, Inc., New York City.  
 Scientific Instrument Co., Detroit.  
 Tagliabue Mfg. Co., C. J., Brooklyn, N. Y.  
 Taylor Instrument Companies, Rochester, N. Y.  
 Weston Electrical Instrument Corp., Newark, N. J.  
 Wheelco Instruments Co., Chicago.

## THERMOSTATS, DAY AND NIGHT, CLOCK

Au-Temp-Co. Corp., New York City.  
 Barber-Colman Company, Rockford, Ill.  
 • Detroit Lubricator Co., Detroit, Mich.  
 • General Controls Co., Glendale, Cal.  
 • General Electric Co., Bloomfield, N. J.



- Gleason-Avery, Inc., Auburn, N. Y.
- Mercoild Corporation, Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Penn Electric Switch Co., Goshen, Ind.
- Perfex Corp., Milwaukee, Wis.
- Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
- Sampsel Time Control, Inc., Spring Valley, Ill.
- Schwab Safe Co., Lafayette, Ind.
- Tork Clock Co., Inc., Mt. Vernon, N. Y.
- White Manufacturing Co., St. Paul, Minn.
- White-Rodgers Electric Co., St. Louis, Mo.

### THERMOSTATS, HEAT ACCELERATED OR ANTICIPATING

- Au-Temp-Co Corp., New York City.
- Automatic Products Co., Milwaukee, Wis.
- Barber-Colman Company, Rockford, Ill.
- Cook Electric Co., Chicago, Ill.
- Detroit Lubricator Co., Detroit, Mich.
- Friez & Sons, Julien P., Baltimore.
- Fulton Sylphon Co., Knoxville, Tenn.
- General Controls Co., Glendale, Cal.
- General Electric Co., Bloomfield, N. J.
- H-B Instrument Co., Inc., Philadelphia, Pa.
- Mercoild Corporation, Chicago, Ill.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Penn Electric Switch Co., Goshen, Ind.
- Perfex Corp., Milwaukee, Wis.
- Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
- Precision Thermometer and Instrument Co., Philadelphia.
- Schwab Safe Co., Lafayette, Ind.
- Spencer Thermostat Co., Attleboro, Mass.
- Tagliabue Mfg. Co., C. J., Brooklyn.
- White-Rodgers Electric Co., St. Louis, Mo.

### THERMOSTATS, LINE VOLTAGE

- Allen-Bradley Company, Milwaukee.
- American Instrument Co., Silver Spring, Md.
- Au-Temp-Co Corp., New York City.
- Automatic Products Co., Milwaukee, Wis.
- Barber-Colman Company, Rockford, Ill.
- D. & M. Mfg. Co., Midland Park, N. J.
- Detroit Lubricator Co., Detroit, Mich.
- Dunn, Inc., Struthers, Philadelphia.
- Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.
- General Controls Co., Glendale, Cal.
- General Electric Co., Bloomfield, N. J.
- H-B Instrument Co., Inc., Philadelphia, Pa.
- Jefferson Electric Co., Bellwood, Ill.
- Mercoild Corporation, Chicago, Ill.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Penn Electric Switch Co., Goshen, Ind.
- Perfex Corp., Milwaukee, Wis.
- Ranco Inc., Columbus, O.
- Russell Electric Co., Chicago, Ill.
- Sampsel Time Control, Inc., Spring Valley, Ill.
- Sarco Company, Inc., New York City.
- Schwab Safe Co., Lafayette, Ind.
- Spencer Thermostat Co., Attleboro, Mass.
- United Electric Controls Co., South Boston, Mass.
- White-Rodgers Electric Co., St. Louis, Mo.

### THERMOSTATS, LOW VOLTAGE

- Allen-Bradley Company, Milwaukee, Wis.
- American Instrument Co., Silver Spring, Md.
- Au-Temp-Co Corp., New York City.
- Automatic Products Co., Milwaukee, Wis.
- Barber-Colman Company, Rockford, Ill.
- Cook Electric Co., Chicago, Ill.
- Crise Electric Mfg. Co., Columbus, Ohio.
- D. & M. Mfg. Co., Midland Park, N. J.
- Detroit Lubricator Co., Detroit, Mich.
- Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.
- General Controls Co., Glendale, Cal.
- General Electric Company, Bloomfield, N. J.
- Gleason-Avery, Inc., Auburn, N. Y.
- H-B Instrument Co., Inc., Philadelphia, Pa.
- Jefferson Electric Co., Bellwood, Ill.
- McCorkle Co., D. H., Berkeley, Cal.
- Magnet Switch Co., Chicago.
- Mercoild Corporation, Chicago, Ill.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Penn Electric Switch Co., Goshen, Ind.
- Perfex Corporation, Milwaukee, Wis.
- Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
- Russell Electric Co., Chicago, Ill.
- Sampsel Time Control, Inc., Spring Valley, Ill.
- Sarco Company, Inc., New York City.
- Schwab Safe Co., Lafayette, Ind.
- Spencer Thermostat Co., Attleboro, Mass.
- United Electric Controls Co., South Boston, Mass.
- White Manufacturing Co., St. Paul, Minn.
- White-Rodgers Electric Co., St. Louis, Mo.

### THERMOSTATS, MODULATING OR PROPORTIONING

- Atlas Valve Company, Newark, N. J. (Air Operated)
- Au-Temp-Co Corp., New York City.
- Barber-Colman Company, Rockford, Ill.
- Defender Automatic Regulator Co., St. Louis.
- H-B Instrument Co., Inc., Philadelphia, Pa.
- Johnson Service Company, Milwaukee, Wis.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Schwab Safe Co., Lafayette, Ind.
- Tagliabue Mfg. Co., C. J., Brooklyn.
- White Manufacturing Co., St. Paul, Minn.

### THROUGH WALL FLASHINGS

*See Flashings, Through Wall*

### TIME SWITCHES

*See Switches, Time*

### TIMING MACHINES

*See Machines, Timing, for Stoker Controls*

### TIMING MOTORS

*See Motors, Timing*

### TINNING FLUXES

*See Compounds, Tinning*

### TOGGLE BOLTS

*See Bolts, Toggle*

### TOOLS, FIRING

- Adams Company, The, Dubuque, Iowa. (Clinker Tongs, Rakes, Hoes, Pokers, Ash Removers for Stokers)
- Farrell-Cheek Steel Company, Stoker Parts Div., Sandusky, O. (Clinker Tongs, Rakes, Hooks, Slice Bars, Pokers, Back-up Wrenches)
- Northwestern Stove Repair Co., Chicago.
- Roesch & Associates, Inc., Syracuse, N. Y.
- Stratton & Terstegge Co., Louisville, Ky. (Clinker Tongs)

### TOOLS, METAL WORKERS'

- Brown-Apppton Company, New York City (Pneumatic Hammer)
- Champion Tool Co., Los Angeles, Cal. (Pipe Crimper)
- Crescent Tool Co., Jamestown, N. Y. (Scratch Awls, Pliers, Screw-drivers)
- Greenlee Tool Co., Rockford, Ill. (Pipe Benders, Chisels, Screw Drivers)
- Grobet File Corp. of America, New York City. (Files)
- Hub Specialty Co., Somerville, Mass. (Awl)
- Johnson Ladder & Shoe Co., Eau Claire, Wis. (Ladder Shoes)
- Millers Falls Co., Greenfield, Mass. (Hack Saws)
- Misener Mfg. Co., Inc., Syracuse, N. Y. (Rotary Hack Saw and Blades, and Hole Saw)
- Myers Ladder Equipment Company, Madison, Wis. (Ladder Brackets)
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Packham Crimper Co., Mechanicsburg, Ohio (Crimping Tongs)
- Peck, Stow & Wilcox Co., Southington, Conn.
- Pencilsharp Awl & Tool Co., Evansville, Ind. (Scratch Awls)
- Penn Tool Co., Philadelphia. (Punches, Chisels and Edge Tools)
- Phillips Drill Co., Chicago. (Anchor Bolt Drill)
- Poe, Ralph W., Canton, Ill. (Sheet Metal Cutters)
- Reiner & Campbell Co., Inc., Elizabeth, N. J. (Dividers)
- Snap-On Tools Corp., Kenosha, Wis. (Hammers, Screw Drivers, Chisels, Punches, Soldering Irons & Pliers)
- Stanley Tools, New Britain, Conn. (Punches, Hammers, Drills, Rules, Cold Chisels)
- Star Electric Motor Co., Bloomfield, N. J. (Drill Sharpener)
- Whitney Mfg. Co., W. A., Rockford, Ill.
- Whitney Metal Tool Co., Rockford, Ill.
- Wodack Electric Tool Corp., Chicago. (Electric Hammer and Groover)

### TOOLS, ROOFERS'

- Aeroll Burner Co., Inc., West New York, N. J. (Melting Kettles, Hoists, Buckets, Tools and Accessories)
- Ajax Building Bracket Co., Cleveland Heights, Ohio (Brackets)
- All States Roofers Equip. & Mat'l Co., Chicago. (Complete Line)
- Belden Machine Company, New Haven, Conn. (Hammer, Ripper, Stake & Punch)
- Eiermann Floor Scraper Co., Port Chester, N. Y. (Tar)
- Frey & Co., Frank P., Chicago.
- Littleford Bros., Cincinnati, O.
- Milcor Steel Co., Milwaukee, Wis.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Pencilsharp Awl & Tool Co., Evansville, Ind.
- Structural Slate Co., Pen Argyl, Pa. (Hammer, Ripper and Stake, also Portable Machine Cutter and Punch)

### TOPS, CHIMNEY

*See Caps and Tops, Chimney*

● Advertisement in this issue. See Index to Advertisers, page 310

## TORCHES, BRAZING, CUTTING, WELDING, ELECTRIC

Borm Manufacturing Company, Elgin, Ill.  
Will-Weld Manufacturing Co., Omaha, Nebr.

## TORCHES, BRAZING, CUTTING, WELDING, OXY-ACETYLENE

- Aeroll Burner Co., Inc., West New York, N. J.
- Air Reduction Sales Co., New York City.
- Bernz Co., Inc., Otto, Rochester, N. Y. (Brazing)
- Burdett Mfg. Co., Chicago, Ill.
- Clayton & Lambert Mfg. Co., Detroit.
- Dockson Corporation, Detroit.
- Gasweld Equipment Co., Chicago.
- Harris Calorific Co., Cleveland, O.
- Imperial Brass Mfg. Co., Chicago, Ill.
- Insto-Gas Corporation, Detroit.
- Johnson Gas Appliance Co., Cedar Rapids, Iowa.
- Linde Air Products Co., The, New York City.
- Marquette Manufacturing Co., Inc., Minneapolis.
- Milburn Co., Alexander, Baltimore, Md.
- Minn-Kota Foundry & Mfg. Co., Fargo, N. D.
- Modern Engineering Co., St. Louis, Mo.
- National Cylinder Gas Co., Chicago.
- National Safety Device Co., Chicago.
- Reiner & Campbell Co., Inc., Elizabeth, N. J.
- Sight Feed Generator Co., Richmond, Ind.
- Smith Welding Equipment Corp., Minneapolis, Minn.
- Torchweld Equipment Div., National Cylinder Gas Co., Chicago, Ill.
- Trindl Products, Ltd., Chicago.
- Welding Apparatus Co., Chicago, Ill.

## TORCHES, SOLDERING

- Bernz Co., Inc., Otto, Rochester, N. Y.
- Choate Mfg. Co., Cincinnati, Ohio.
- Clayton & Lambert Mfg. Co., Detroit, Mich.
- Detroit Torch & Mfg. Co., Detroit, Mich.
- Diener Mfg. Co., Geo. W., Chicago, Ill.
- Everhot Mfg. Co., Maywood, Ill.
- Gasweld Equipment Co., Chicago.
- Harris Calorific Co., Cleveland, O.
- Ideal Commutator Dresser Co., Sycamore, Ill.
- Imperial Brass Mfg. Co., Chicago, Ill.
- Insto-Gas Corporation, Detroit.
- Johnson Gas Appliance Co., Cedar Rapids, Ia.
- Lenk Mfg. Company, Newton Lower Falls, Mass.
- Linde Air Products Co., The, New York City.
- Minn-Kota Foundry & Mfg. Co., Fargo, N. D.
- Modern Engineering Co., St. Louis.
- National Safety Device Co., Chicago.
- Reiner & Campbell Co., Inc., Elizabeth, N. J.
- Reliable Gas Products Co., Cedar Rapids, Ia.
- Sight Feed Generator Co., Richmond, Ind.
- Smith Welding Equipment Corp., Minneapolis, Minn.
- Torchweld Equipment Div., National Cylinder Gas Co., Chicago, Ill.
- Torit Manufacturing Co., St. Paul, Minn.
- Turner Brass Works, Sycamore, Ill.
- Van Praag Sales, New York City.
- Wall Mfg. Supply Co., P., N. S. Pittsburgh.
- Welding Apparatus Co., Chicago, Ill.

## TRANSFORMERS, IGNITION

Webster Electric Co., Racine, Wis.

## TRANSFORMERS, LOW VOLTAGE

- Barber-Colman Co., Rockford, Ill.
- Canatsey Electric Manufacturing Co., Kansas City, Mo.
- Cook Electric Co., Chicago, Ill.
- Detroit Lubricator Co., Detroit, Mich.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.
- General Controls Co., Glendale, Cal.
- General Electric Co., Schenectady, N. Y.
- Ideal Commutator Dresser Co., Sycamore, Ill.
- Jefferson Electric Co., Bellwood, Ill.
- Mercoild Corporation, Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
- Russell Electric Co., Chicago, Ill.
- Taylor-Winfield Corp., Warren, O.
- Wagner Electric Corp., St. Louis, Mo.
- Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.

## TRIM, ORNAMENTAL

*See Moulding and Trim, Ornamental*

## TUBING, COPPER

- American Brass Co., Waterbury, Conn.
- Bridgeport Brass Co., Bridgeport, Conn.
- Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
- Conklin Brass & Copper Co., Inc., T. E., New York City.
- Downs-Smith Brass & Copper Co., Inc., New York City.
- Foster Wheeler Corp., New York City.

- Hussey & Co., C. G., Pittsburgh, Pa.
- Imperial Brass Mfg. Co., Chicago, Ill.
- Lewin-Mathes Company, Lewin Metals Div., East St. Louis, Ill.
- McDonnell & Miller, Chicago.
- Mueller Brass Co., Port Huron, Mich.
- Parker Appliance Co., Cleveland.
- Phelps Dodge Copper Products Corp., British American Tube Div., New York City.
- Revere Copper & Brass Incorporated, New York City.
- Roberts Tube Works, Detroit.
- Scovill Mfg. Co., Morency-Van Buren Div., Sturgis, Mich.
- United States Brass & Copper Co., Hyde Park, Mass.
- Wolverine Tube Co., Detroit, Mich.

## UNITS, AIR CONDITIONING

*See Air Conditioning Units*

## UNITS, FUEL FOR OIL BURNERS

- Kraissl Company, Inc., Hackensack, N. J.
- Monarch Manufacturing Works, Inc., Philadelphia.
- Sunstrand Pump Division, Rockford, Ill.
- Webster Electric Co., Racine, Wis.

## UNITS, WINDOW VENTILATOR AND FILTER

- Ad-Lee Co., Inc., Chicago.
- Airgard Manufacturing Co., Chicago.
- Airmode Manufacturing Co., Chicago.
- American Air Conditioning Co., Detroit.
- Automatic Ventilator Company, Corunna, Mich.
- Berger Mfg. Div., Republic Steel Corp., Canton, O.
- Carrier Corp., Syracuse, N. Y.
- Davies Air Filter Corp., New York, N. Y.
- Fairbanks, Morse & Co., Chicago.
- Gale Products, Galesburg, Ill.
- General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
- Ilg Electric Ventilating Co., Chicago.
- Kaiser Co., H. S., Chicago, Ill.
- Kauffman Air Conditioning Corp., St. Louis.
- Mellish & Murray Co., Chicago.
- Reed Unit-Fans, Inc., New Orleans, La.
- Somers, Inc., H. J., Detroit, Mich.
- Staynew Filter Corp., Rochester, N. Y.
- Todd Air Conditioning Company, Inc., Bonner Springs, Kan.
- Unified Air Conditioner Co., Duluth, Minn.
- U. S. Air Conditioning Corp., Minneapolis.
- Utility Fan Corporation, Los Angeles.
- Vita-Screen Ventilator Co., New York City.

## VACUUM CLEANERS FOR FURNACES

*See Cleaners, Vacuum, Furnace*

## VALVES, GAS PRESSURE REGULATING

- Atlas Valve Co., Newark, N. J.
- Barber Gas Burner Co., Cleveland, O.
- Belfield Co., H., Philadelphia.
- Brown Instrument Co., Div. Minneapolis-Honeywell Regulator Co., Philadelphia.
- Bryant Corp., C. L., Cleveland, O.
- Defender Automatic Regulator Co., St. Louis.
- Fisher Governor Co., Marshalltown, Ia.
- Fox Control & Mfg. Co., Cleveland.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.
- Fulton Sylphon Co., Knoxville, Tenn.
- General Controls Co., Glendale, Cal.
- Golden-Anderson Valve Specialty Co., Pittsburgh.
- Hotstream Heater Co., Cleveland, O.
- Mercoild Corp., Chicago, Ill.
- Milwaukee Gas Specialty Company, Milwaukee.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Mueller Co., Decatur, Ill.
- Pacific Gas Radiator Co., Huntington Park, Cal.
- Payne Furnace & Supply Co., Beverly Hills, Cal.
- Perfex Corporation, Milwaukee, Wis.
- Roberts-Gordon Appliance Corp., Buffalo, N. Y.
- Tagliabue Mfg. Co., C. J., Brooklyn.

## VALVES, HUMIDIFIER, WATER LEVEL

- Badger Mfg. & Sales Co., Milwaukee.
- Barclay, Inc., Robert, Chicago.
- Belfield Co., H., Philadelphia.
- Fisher Governor Co., Marshalltown, Ia.
- G. & S. Tool Co., Detroit, Mich.
- General Controls Co., Glendale, Cal.
- Golden-Anderson Valve Specialty Co., Pittsburgh.
- Mald-O'-Mist, Inc., Chicago, Ill.
- McDonnell & Miller, Chicago, Ill.
- Minneapolis-Honeywell Regulator Co., Minneapolis.
- Monmouth Products Co., Cleveland, O.
- Rockford Brass Works, Rockford, Ill.
- Scovill Mfg. Co., Morency-Van Buren Div., Sturgis, Mich.
- Skuttle Sales Co., Detroit.
- Supreme Electric Products Corp., Rochester, N. Y.
- Viking Air Conditioning Corp., Cleveland.

## VALVES, SOLENOID

- Albright Equipment Co., Pittsburgh.
- Alco Valve Co., St. Louis, Mo.
- Anderson Products, Inc., Cambridge, Mass.
- Atkins & Company, E. C., Indianapolis, Ind.
- Au-Temp-Co Corp., New York City.
- Automatic Products Co., Milwaukee, Wis.
- Automatic Switch Co., New York City.
- Barber-Colman Co., Rockford, Ill.
- Belfield Co., H., Philadelphia.
- Cooper Co., Clark, Palmyra, N. J.
- Cutler-Hammer, Inc., Milwaukee, Wis.
- Davis Regulator Co., Chicago.
- Detroit Lubricator Co., Detroit.
- Electric Valve Mfg. Co., Inc., New York City.
- Electromatic Corp., Chicago, Ill.
- Frick Company, Waynesboro, Pa.
- Friez & Sons, Julien P., Div. Bendix Aviation Corp., Baltimore.
- General Controls Co., Glendale, Cal. (Magnetic)
- General Electric Co., Schenectady, N. Y.
- General Sales & Products Co., Cohoes, N. Y.
- Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
- Guardian Electric Mfg. Co., Chicago, Ill.
- Hubbell Corp., Chicago.
- Hunt & Son, C. B., Salem, O.
- McDonnell & Miller, Chicago.
- Mercold Corp., Chicago, Ill.
- Milwaukee Gas Specialty Company, Milwaukee.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Parker Appliance Co., Cleveland.
- Payne Furnace & Supply Co., Inc., Beverly Hills, Cal.
- Penn Electric Switch Co., Goshen, Ind.
- Pfening Co., Fred D., Columbus, O.
- R-S Products Corporation, Philadelphia.
- Ruggles-Klingemann Mfg. Co., Salem, Mass.
- Sarco Co., Inc., New York City.
- Spoehrer-Lange Co., St. Louis.
- Square D Company, Detroit.
- Supreme Electric Products Corp., Rochester, N. Y.
- Wheelco Instruments Co., Chicago.
- White-Rodgers Electric Co., St. Louis.

## VANES, DUCT TURNING, PREFABRICATED

- Barber-Colman Company, Rockford, Ill.
- Tuttle & Bailey, Inc., New Britain, Conn.
- Waterloo Register Company, Waterloo, Iowa.

## VENETIAN BLINDS

See *Blinds, Venetian*

## VENTILATORS, CEILING

- Airmaster Corp., Chicago, Ill.
- Auer Register Co., Cleveland, O.
- Barber-Colman Company, Rockford, Ill.
- Best Register Co., Milwaukee, Wis.
- Champion Blower & Forge Co., Lancaster, Pa.
- Chelsea Fan & Blower Co., Inc., Irvington, N. J.
- Decatur Iron & Steel Co., Decatur, Ala.
- Economy Electric Manufacturing Co., Cicero, Ill.
- Falstrom Co., Passaic, N. J.
- Gillian Mfg. Co., Detroit.
- Hart & Cooley Mfg. Co., Holland, Mich.
- Klauser Manufacturing Co., Dubuque, Ia.
- Lamneck Products Co., Middletown, O.
- Martin Metal Mfg. Co., Wichita, Kan.
- Milcor Steel Co., Milwaukee, Wis.
- Miller & Doing, Inc., Brooklyn, N. Y.
- Tuttle & Bailey, Inc., New Britain, Conn.
- United States Register Co., Battle Creek, Mich.
- Universal Blower Co., Birmingham, Mich.

## VENTILATORS, MUSHROOM

- Aeolus Dickinson, Chicago, Ill.
- Best Register Co., Milwaukee, Wis.
- Industrial Sheet Metal Works, Inc., Detroit, Mich.
- Knowles Mushroom Ventilator Co., Montclair, N. J.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Tuttle & Bailey, Inc., New Britain, Conn.
- Ventilating Products Co., Chicago.

## VENTILATORS, ROOF, FAN

- Aeolus Dickinson, Chicago, Ill.
- Air Controls, Inc., Cleveland.
- Airmaster Corp., Chicago, Ill.
- Akrat Ventilator Co., Chicago.
- Allen Corp., Detroit, Mich. (Turbine)
- American Coolair Corp., Jacksonville, Fla.
- American-Larson Ventilating Co., Pittsburgh, Pa.
- Arex Co., Chicago, Ill.
- Autovent Fan & Blower, Div. Herman Nelson Corporation, Chicago.
- Belanger Fan & Blower Co., Detroit, Mich.
- Burt Mfg. Co., Akron, O.
- Century Fan & Ventilating Corp., New York City. (Turbine)
- Chelsea Fan & Blower Co., Inc., Irvington, N. J.
- Clay Equipment Corp., Cedar Falls, Ia.
- Davidson Hy Duty Roof Fan Co., Newton, Mass.
- DeBothezat Ventilating Equipment Division, American Machine & Metals, Inc., East Moline, Ill.

- Diehl Mfg. Company, Elizabethport, N. J.
- Dual-Air Fan Corporation, Chicago.
- Economy Electric Mfg. Co., Cicero, Ill.
- Electrovent Fan & Mfg. Co., Chicago, Ill.
- Empire Ventilation Equipment Co., Long Island City, N. Y.
- Fingles Co., The, Baltimore, Md.
- Gallaher Company, Owatonna, Minn.
- Goethel Co., Alfred C., Milwaukee, Wis.
- Grand Rapids Blow Pipe and Dust Arrester Co., Grand Rapids, Mich.
- Hirschman Co., Inc., W. F., Buffalo, N. Y.
- Howes-Woods Company, Charlestown, Boston.
- Ilg Electric Ventilating Co., Chicago, Ill.
- Industrial Sheet Metal Works, Inc., Detroit, Mich.
- International Engineering, Inc., Dayton, O.
- Iona Ventilator Co., Inc., Philadelphia, Pa.
- Johnson Fan & Blower Corp., Chicago, Ill.
- Jordan & Co., Paul R., Indianapolis, Ind. (Turbine)
- Kernchen Co., Chicago, Ill.
- King Ventilating Co., Owatonna, Minn.
- Klauser Manufacturing Co., Dubuque, Ia.
- Lohman Inc., William J., Irvington, N. J.
- Myers Electric Co., Pittsburgh, Pa.
- New York Blower Co., Chicago.
- Penn Ventilating Co., Philadelphia, Pa.
- Phoenix Ventilator Co., Inc., Brooklyn, N. Y.
- Propellair, Inc., Springfield, O.
- Reed Unit-Fans, Inc., New Orleans, La.
- Robertson Co., H. H., Pittsburgh, Pa.
- Royal Ventilator Co., Philadelphia, Pa.
- Schwitzer-Cummins Co., Indianapolis, Ind.
- Sturtevant Co., B. F., Hyde Park, Boston, Mass.
- Swartwout Co., Cleveland.
- Trade-Wind Motor Fans, Inc., Los Angeles, Cal.
- Truflo Fan Co., Harmony, Pa.
- Uno Ventilator Co., Cliftondale, Mass. (Turbine)
- Utility Fan Corporation, Los Angeles.
- Van Noorden Company, E., Boston.
- Viking Air Conditioning Corp., Cleveland, O.
- Washburne & Co., E. G., New York City.
- Waverly Heating Supply Co., Boston.
- Western Engineering & Mfg. Co., Los Angeles, Cal.
- Wing Mfg. Co., L. J., New York City.

## VENTILATORS, ROOF, GRAVITY

- Accurate Mfg. Works, Chicago, Ill.
- Aeolus Dickinson, Chicago, Ill.
- Airtherm Mfg. Co., St. Louis, Mo.
- Akrat Ventilator Co., Chicago.
- Allen Corp., Detroit, Mich. (Turbine)
- American-Larson Ventilating Co., Pittsburgh, Pa.
- American Metal Products, Fort Worth, Tex.
- American Sheet Metal Works, New Orleans, La.
- Ames Co., W. R., San Francisco, Cal.
- Anderson Mfg. Co., Des Moines, Ia.
- Arex Co., Chicago, Ill.
- Autoforce Ventilating System, Boston.
- Berger Bros. Co., Philadelphia, Pa.
- Breidert, G. C., Los Angeles, Cal.
- Burt Mfg. Co., Akron, O.
- Century Fan & Ventilator Corp., New York City.
- Chicago Metal Mfg. Co., Chicago, Ill.
- Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Clay Equipment Corp., Cedar Falls, Ia.
- Day Co., The, Minneapolis, Minn.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Empire Ventilation Equipment Co., Long Island City, N. Y.
- Fingles Co., The, Baltimore, Md.
- Goethel Co., Alfred C., Milwaukee, Wis.
- Grand Rapids Blow Pipe & Dust Arrester Co., Grand Rapids, Mich.
- Hirschman Co., Inc., W. F., Buffalo, N. Y.
- Howes-Woods Company, Charlestown, Boston.
- Industrial Sheet Metal Works, Inc., Detroit, Mich.
- International Steel Co., Evansville, Ind.
- Iona Ventilator Co., Inc., Philadelphia, Pa.
- Iwan Brothers, South Bend, Ind.
- Jamar Co., Walker, Duluth, Minn.
- Jordan & Co., Paul R., Indianapolis, Ind. (Turbine)
- Kernchen Co., Chicago, Ill.
- King Ventilating Co., Owatonna, Minn.
- Klauser Manufacturing Co., Dubuque, Ia.
- Kleenaire Corp., Stevens Point, Wis.
- LaCrosse Steel Roofing & Corrugating Co., LaCrosse, Wis.
- Lamneck Products Inc., Middletown, O.
- Lee & Son Co., Thomas, Cincinnati, O.
- Leslie Welding Co., Chicago. (Slant Roof Louver)
- Levow, David, New York City.
- Martin Metal Mfg. Co., Wichita, Kan.
- Mellish & Murray Co., Chicago, Ill.
- Merchant & Evans Co., Philadelphia, Pa.
- Milcor Steel Co., Milwaukee, Wis.
- Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
- Osborn Co., J. M. & L. A., Cleveland.
- Patten Co., J. V., Sycamore, Ill.
- Phoenix Ventilator Co., Inc., Brooklyn.
- Pioneer Roofing & Sheet Metal Co., Muskogee, Okla.
- Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
- Robertson Co., H. H., Pittsburgh, Pa.
- Royal Ventilator Co., Philadelphia, Pa.

● Advertisement in this issue. See Index to Advertisers, page 310



Rynker Sheet Metal Works, Inc., Billings, Mont.  
 St. Paul Corrugating Co., St. Paul, Minn.  
 Schoedinger Co., F. O., Columbus, O.  
 Sheet Metal Mfg. Co., Inc., Brooklyn.  
 Southbridge Roofing Co., Inc., Southbridge, Mass.  
 Southern States Iron Roofing Co., Savannah, Ga.  
 Tierney Rotor Ventilator Co., Minneapolis, Minn.  
 Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.  
 Uno Ventilator Co., Cliftondale, Mass. (Turbine)  
 Van Noorden Co., E. Boston, Mass.  
 Western Engineering & Mfg. Co., Los Angeles.  
 • Willis Steel Corporation, Galesburg, Ill.  
 York Corrugating Co., York, Pa.

## VIBRATION ISOLATORS

*See Bases and Pads*

## VENTILATORS, ROOF, RIDGE

Aeolus Dickinson Co., Chicago.  
 Arex Company, Chicago.  
 Burt Manufacturing Company, Akron, Ohio.  
 Century Fan & Ventilator Corp., New York City.  
 Klauer Mfg. Co., Dubuque, Ia.  
 Robertson Company, H. H., Pittsburgh, Pa.  
 • Swartwout Company, Cleveland.  
 Van Noorden Company, E., Boston.

## WARM AIR REGISTER SHIELDS

*See Shields, Warm Air Register*

## WASHERS, AIR, HEATING AND VENTILATING

(Capacity 4,000 c.f.m. and up)

Air & Refrigeration Corp., New York City.  
 Airwasher Corporation, Lansing, Mich.  
 American Blower Corp., Detroit, Mich.  
 Ames Co., W. R., San Francisco, Cal.  
 Atlas Heating & Ventilating Co., Ltd., San Francisco.  
 Ballantyne Co., Omaha, Nebr.  
 • Bayley Blower Co., Milwaukee, Wis.  
 Betz Air Conditioning Corp., Kansas City, Mo.  
 Bishop & Babcock Mfg. Co., Cleveland, O.  
 Blower Application Co., Milwaukee, Wis.  
 Buffalo Forge Co., Buffalo, N. Y.  
 Carrier Corp., Syracuse, N. Y.  
 • Clarage Fan Co., Kalamazoo, Mich.  
 Columbus Heating & Ventilating Co., Columbus, O.  
 Electrovent Fan & Mfg. Co., Chicago, Ill.  
 Industrial Sheet Metal Works, Inc., Detroit, Mich.  
 McLouth Air Conditioning Corp., Lansing, Mich.  
 Murray Manufacturing Co., D. J., Wausau, Wis.  
 Mellish & Murray Co., Chicago, Ill.  
 New York Blower Co., Chicago, Ill.  
 Niagara Blower Co., New York City.  
 Northern Blower Co., Cleveland, O.  
 Parks-Cramer Co., Fitchburg, Mass.  
 Phillips Cooling Tower Co., Inc., New York City.  
 Ross Sprinkler Co., Pasadena, Cal.  
 Spray Engineering Co., Somerville, Mass.  
 Spray Wheel Air Conditioners, Inc., Denver, Colo.  
 Strandwitz & Co., Inc., W. J., Camden, N. J.  
 • Sturtevant Co., B. F., Hyde Park, Boston, Mass.  
 Supreme Heater & Ventilating Corp., St. Louis, Mo.  
 Todd Air Conditioning Company, Inc., Bonner Springs, Kan.  
 Trane Co., La Crosse, Wis.  
 • U. S. Air Conditioning Corp., Minneapolis, Minn.  
 • Utility Fan Corporation, Los Angeles, Cal.  
 Vilter Mfg. Company, Milwaukee.  
 Western Blower Co., Seattle, Wash.  
 York Ice Machinery Corp., York, Pa.

## WATERPROOFING

Barrett Division, Allied Chemical & Die Corporation, New York City.  
 Carey Mfg. Co., Philip, Cincinnati, Ohio.  
 • Cheney Co., Ardmore, Pa.  
 Flintkote Co., New York City.  
 General Insulating Products Co., Brooklyn, N. Y.  
 Glidden Company, Cleveland.  
 Horn Co., A. C., Long Island City.  
 Johns-Manville Sales Corp., New York City.  
 Koppers Company, Pittsburgh.  
 Lehon Company, Chicago.  
 Nebel Manufacturing Co., Cleveland.  
 Ruberoid Co., New York City.  
 Sisalkraft Co., Chicago, Ill.  
 Sonneborn Sons, Inc., L., New York City.  
 Southport Paint Co., Savannah, Ga.  
 Toch Brothers, Inc., Elm Park, S. I., N. Y.  
 Truscon Laboratories, Detroit.  
 X-Pando Corporation, Long Island City, N. Y.

## WATERPROOFING COMPOUNDS

*See Compounds, Waterproofing*

## WATER HEATERS

*See Coils, Fire Pot, Hot Water*

## WELDERS, ARC

Air Reduction Sales Company, New York City.  
 Allied Welding Crafts, Inc., Indianapolis, Ind.  
 Allis-Chalmers Manufacturing Company, Milwaukee.  
 Alter-Arc Mfg. Co., Lawton, Okla. (A. C.)  
 Bear Mfg. Co., Rock Island, Ill.  
 Borm Manufacturing Company, Elgin, Ill.  
 Burke Electric Co., Erie, Pa.  
 Commonwealth Electric Welder Mfg. Co., Philadelphia.  
 (A. C.)  
 • Eisler Engineering Co., Newark, N. J.  
 Electric Arc, Inc., Newark, N. J.  
 Emerson Electric Mfg. Co., St. Louis. (A. C.)  
 Ergolyte Mfg. Co., Philadelphia.  
 Fern, Ralph, Scranton, Pa.  
 General Equipment Co., Wichita, Kan.  
 General Electric Co., Schenectady, N. Y.  
 Hammett Electric Mfg. Co., Kansas City, Mo.  
 Hampton Elec. Tool Co., Pittsburgh, Pa. (A. C.)  
 Harnischfeger Corp., Milwaukee, Wis. (Electric).  
 Hobart Brothers Co., Troy, O.  
 Hollup Corp., Div. National Cylinder Gas Co., Chicago.  
 Ideal Commutator Dresser Co., Sycamore, Ill.  
 Ideal Electric & Mfg. Co., Mansfield, O.  
 Imperial Electric Co., Akron, O.  
 Lee Co., K. O., Aberdeen, S. D.  
 Lincoln Electric Co., Cleveland, O.  
 Maple Valley Mfg. Co., Mapleton, Ia.  
 Marquette Manufacturing Co., Inc., Minneapolis. (A. C.)  
 Miller Electric Mfg. Co., Inc., Appleton, Wis. (Portable)  
 Owen-Dyneto Div. USL Battery Corp., Syracuse, N. Y.  
 Sight Feed Generator Co., Richmond, Ind.  
 Smith Welding Equipment Corp., Minneapolis, Minn.  
 Star Electric Motor Co., Bloomfield, N. J.  
 Trindl, Inc., Jos. H., Chicago.  
 Trindl Products, Ltd., Chicago.  
 Una Welding Incorporated, Cleveland.  
 Universal Power Corporation, Cleveland.  
 Welding Apparatus Co., Chicago, Ill.  
 Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.  
 Will-Weld Mfg. Co., Inc., Omaha, Nebr. (A. C.)  
 Wilson Welder & Metals Co., Inc., New York City.

## WELDERS, SPOT

• Acme Electric Welder Co., Los Angeles.  
 Agnew Electric Co., Milford, Mich.  
 Alphil Spot Welding Co., New York City.  
 Dyer Welder & Engineering Co., Kansas City, Mo.  
 • Eisler Engineering Co., Newark, N. J.  
 Electric Arc, Inc., Newark, N. J.  
 Federal Machine & Welder Co., Warren, O.  
 Micro Products Co., Chicago, Ill.  
 Pier Equipment Manufacturing Co., Benton Harbor, Mich.  
 (Foot operated and motor driven.)  
 Taylor-Hall Welding Corp., Worcester, Mass.  
 Taylor-Winfield Corp., Warren, O. (Butt and Seam)  
 Thomson-Gibb Electric Welding Co., Lynn, Mass.  
 Universal Power Corporation, Cleveland.  
 Weldex, Inc., Detroit.  
 Westinghouse Electric & Manufacturing Co., East Pittsburgh.

## WELDING EQUIPMENT, OXY-ACETYLENE

Air Reduction Sales Co., New York City.  
 Automatic Gasflux Mfg. Co., Mansfield, O.  
 Burdett Mfg. Co., Chicago, Ill.  
 Carbo-Oxygen Co., Pittsburgh, Pa.  
 Dockson Corporation, Detroit.  
 Gasweld Equipment Co., Chicago, Ill.  
 Harris Calorific Co., Cleveland, O.  
 Imperial Brass Mfg. Co., Chicago, Ill.  
 Jewel Mfg. Co., St. Paul, Minn.  
 Linde Air Products Co., The, New York City.  
 Marquette Manufacturing Co., Inc., Minneapolis.  
 Milburn Co., Alexander, Baltimore, Md.  
 Modern Engineering Co., St. Louis, Mo.  
 Ransome Concrete Machinery Co., Industrial Div., Dunel-  
 • Reiner & Campbell Co., Inc., Elizabeth, N. J.  
 Smith Welding Equipment Corp., Minneapolis, Minn.  
 Torchweld Equipment Div., National Cylinder Gas Co.,  
 Chicago, Ill.  
 Victor Equipment Co., San Francisco.

## WELDING ROD

*See Rod, Welding*

## WELDING TORCHES

*See Torches, Brazing, Cutting, Welding*

## WHEELS, BLOWER

Advance Aluminum Castings Corp., Chicago, Ill.  
 Air Controls, Inc., Cleveland, O.  
 American Blower Corp., Detroit, Mich.  
 Autovent Fan & Blower, Div. Herman Nelson Corporation,  
 Chicago.  
 • Bayley Blower Co., Milwaukee, Wis.

- Bishop & Babcock Mfg. Co., Cleveland, O.  
 Buffalo Forge Co., Buffalo, N. Y.  
 Champion Blower & Forge Co., Lancaster, Pa.  
 ●Clarage Fan Co., Kalamazoo, Mich.  
 Economy Electric Manufacturing Co., Cicero, Ill.  
 Hastings Air Conditioning Co., Inc., Hastings, Nebr.  
 Jaden Mfg. Co., Inc., F., Hastings, Nebr.  
 Janette Mfg. Co., Chicago, Ill.  
 ●Lau Blower Co., Dayton, O.  
 Morrison Products, Inc., Cleveland.  
 New York Blower Co., Chicago.  
 Palmer Manufacturing Corp., Phoenix, Ariz.  
 Peerless Electric Co., Warren, O.  
 ●Schwitzer-Cummins Co., Indianapolis, Ind.  
 ●Sturtevant Co., B. F., Hyde Park, Boston, Mass.  
 Torrington Mfg. Co., Torrington, Conn.  
 ●Triangle Mfg. Co., Oshkosh, Wis.  
 ●U. S. Air Conditioning Corp., Minneapolis, Minn.  
 ●Utility Fan Corporation, Los Angeles, Cal.  
 Viking Air Conditioning Corp., Cleveland, O.  
 Western Blower Company, Seattle, Wash.

### WINDOW FANS

*See Fans, Window*

### WINDOWS, HEAT INSULATING

- Advance Insulating Co., Pittsburgh.  
 Anderson Corp., Bayport, Minn.  
 Chamberlin Metal Weather Strip Co., Detroit.  
 Detroit Steel Products Co., Detroit, Mich.  
 Kane Mfg. Corp., Kane, Pa.  
 Libbey-Owens-Ford Glass Co., Toledo, O.  
 Russell Co., F. C., Cleveland, O.  
 Truscon Steel Co., Youngstown, O.

### WINDOWS, HOLLOW METAL

- American Sheet Metal Works, New Orleans, La.  
 Biersach & Neidermeyer Co., Milwaukee, Wis.  
 Herrmann & Grace Co., Brooklyn, N. Y.

- International Steel Co., Evansville, Ind.  
 Newman Brothers, Inc., Cincinnati, O.  
 Perkinson & Brown, Chicago, Ill.  
 Russell Co., F. G., Cleveland, O.  
 Truscon Steel Co., Youngstown, O.  
 ●Willis Steel Corporation, Galesburg, Ill.

### WIRE GLASS

*See Glass, Wire*

### WIRE, PLAIN, GALVANIZED AND COPPERED

- Allegheny Ludlum Steel Corp., Pittsburgh. (Stainless)  
 Aluminum Co. of America, Pittsburgh, Pa. (Aluminum)  
 American Nickeloid Co., Peru, Ill. (Chrome, nickel coated)  
 American Steel & Wire Co., Cleveland.  
 Angell Nail & Chaplet Co., Cleveland.  
 Atlantic Steel Company, Atlanta, Ga.  
 Berger Mfg. Div. Republic Steel Corp., Canton, O.  
 ●Bethlehem Steel Co., Bethlehem, Pa. (Plain, galvanized)  
 California Wire Cloth Corp., Oakland, Cal.  
 Columbia Steel Co., San Francisco, Cal.  
 ●Continental Steel Corp., Kokomo, Ind. (Plain, galvanized steel)  
 Copperweld Steel Co., Glassport, Pa.  
 ●Hussey & Co., C. G., Pittsburgh.  
 Jones & Laughlin Steel Corp., Pittsburgh, Pa. (Galvanized)  
 Page Steel & Wire Div., Monessen, Pa.  
 ●Republic Steel Corp., Cleveland, O. (Steel)  
 Roebling's Sons Co., John A., Trenton, N. J.  
 Seneca Wire & Mfg. Co., Fostoria, O.  
 Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.  
 Townsend Co., New Brighton, Pa. (Plain and coppered)  
 Wheeling Corrugating Co., Wheeling, W. Va.  
 Wheeling Steel Corp., Wheeling, W. Va.  
 Wickwire Spencer Steel Co., New York City.  
 Youngstown Sheet & Tube Co., Youngstown, O.

### WIRING MACHINES

*See Machines, Wiring*

Section of  
**American Artisan**  
 1942 DIRECTORY OF WARM AIR HEATING, RESIDENTIAL  
 AIR CONDITIONING AND SHEET METAL PRODUCTS  
 [Section 2—TRADE NAMES]

**A**

- ABC**—Blower-Washer units. American Blower Corp., Detroit.
- ABC**—Air Conditioning Furnaces and Oil Burners. Automatic Burner Corp., Chicago, Ill.
- ACB**—Metal Protecting Paint, Tropical Paint & Oil Co., Cleveland.
- A/C**—Washable Filters. American Air Filter Co., Inc., Louisville, Ky.
- A-P**—Controls, Motors, Thermostats, Valves. Automatic Products Co., Milwaukee, Wis.
- A. W.**—Plates. Alan Wood Steel Co., Conshohocken, Pa.
- Ablo**—Waterproofing Compounds. American Barlock Co., Inc. Long Island City, N. Y.
- Abrasoweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Acco-Lastic**—Caulking Compounds. Accurate Metal Weather Strip Co., New York, N. Y.
- Ace**—Mallets. Fowler Pem Co., Emeryville, Cal.
- Ace-Pier**—Arc and Spot Welders. Pier Equipment Mfg. Co., Benton Harbor, Mich.
- Acollite (Bakelite)**—Enamels. Acorn Refining Co., Cleveland.
- Acratherm**—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Activ-Air**—Air Conditioning Furnaces. Hell Co., Milwaukee, Wis.
- Activ-Flame**—Oil Burners. Hell Co., Milwaukee, Wis.
- Adamant**—Insulating Cement. Botsfield Refractories Co., Philadelphia.
- Ada-Stic**—Insulating Cement. Botsfield Refractories Co., Philadelphia.
- Adjusto**—Fire Pot Colls. Radiator Specialty Co., Charlotte, N. C.
- Aeracool**—Fan Blades, Fans, Louvres and Shutters, Ventilators. Myers Electric Co., Pittsburgh, Pa.
- Aerisweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Aero**—Kitchen Exhaust Fans. Pryne & Co., Inc., Los Angeles.
- Aerocrat**—Blowers, Louvres, Washers. W. R. Ames Co., San Francisco, Cal.
- Aerofuse**—Air Diffusers. Tuttle & Bailey, Inc., New Britain, Conn.
- Aerolux**—A. C. Furnaces. S. T. Johnson Co., Oakland, Cal.
- Aeropel**—Kitchen Exhaust Fans. American Blower Corp., Detroit, Mich.
- Aeroplane**—Ventilators. Paul R. Jordan & Co., Indianapolis, Ind.
- Aeroplex**—Blowers. Bayley Blower Co., Milwaukee, Wis.
- Aeropull**—Ventilators. Paul R. Jordan & Co., Indianapolis, Ind.
- Aerospot**—Fans. South Bend Air Products, Inc., South Bend, Ind.
- Aerovalue**—Ventilators. Knowles Mushroom Ventilator Co., Montclair, N. J.
- Afco**—Blowers, Blower-Filters, Furnaces and Stokers. American Furnace Co., St. Louis, Mo.
- Afco Master-Gas**—Furnaces. American Furnace Co., St. Louis.
- Affco**—Grilles, Louvres, American Foundry & Furnace Co., Bloomington, Ill.
- Agile**—Welding Electrodes. American Agile Corp., Cleveland.
- Agitair**—Air Diffusers. Air Devices, Inc., New York City.
- Air-Ace**—Furnaces. Iron Fireman Manufacturing Co., Cleveland.
- Air-Acoustic**—Insulation. Johns-Manville, New York City.
- Airate**—Fans and Ventilators. Air Controls, Inc., Cleveland.
- Airate**—Ventilators. Aeolus Dickinson, Chicago.
- Air-A-Way**—Ventilators. American Metal Products, Fort Worth, Tex.
- Airboy**—Blower Filter. The Peerless Electric Co., Warren, Ohio.
- Airco**—Electrodes, Soldering Flux, Welding Rod, Torches and Welding Equipment. Air Reduction Sales Co., New York City.
- Air-Con**—Heating & Ventilating Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
- Air Control**—Air Conditioning Units, Bearings, Blowers, Blower-Filters, Blower Housings and Wheels. Hastings Air Conditioning Co., Inc., Hastings, Nebr.
- Air-Dux**—Prefabricated Ducts and Fittings. Wood Industries, Inc., Gar, Detroit.
- Air-X-Hauster**—Ventilators. G. C. Breidert, Los Angeles.
- AireOzonet**—Air Conditioning Furnace. AireOzone Corp., Chicago.
- Aire-RAY-ator**—Furnaces. Ray Oil Burner Co., San Francisco.
- Airex**—Air Conditioning Units, Blowers and Fans. Mountain States Equipment Co., Denver, Colo.
- Air-Fan**—Window Ventilators. Ad-Lee Co., Inc., Chicago.
- Airflo**—Pipe, Fittings and Accessories. Milcor Steel Co., Milwaukee.
- Airflo**—Furnaces. Aladdin Heating Corp., Oakland, Cal.
- Aire-Flo**—Furnaces. Lennox Furnace Co., Marshalltown, Ia.
- Aire-Flo—Furnaces**. Lennox Furnace Co., Chicago.
- Air-Flo**—Ventilators. Belanger Fan & Blower Co., Detroit.
- Air Flo**—Ventilators. Aeolus Dickinson, Chicago.
- Airfoil**—Fans and Fan Blades. Aerovent Fan Co., Piqua, O.
- Air Force**—Attic Fan. Vulcan Metal Products Co., Birmingham, Ala.
- Airguide**—Hygrometers and Thermometers. Fee & Stemwedel, Inc., Chicago, Ill.
- Airidge**—Ridge Ventilators. Aeolus Dickinson Co., Chicago.
- Airistocrat**—Fan Blades. Torrington Mfg. Co., Torrington, Conn.
- Airjector**—Ventilators. Swartwout Co., Cleveland.
- Airkem**—Chemical Odor Neutralizer. Airox Company, New York City.
- Airklenzer**—Furnaces. Round Oak Co., Dowagiac, Mich.
- Air Kooler**—Evaporative Conditioners. Utility Fan Corporation, Los Angeles.
- Air-Lift**—Blowers and Fans. Mauer Engineering, Evanston, Ill.
- Airline**—Furnaces. Joliet Heating Corp., Joliet, Ill.
- Airline**—Registers & Grilles. Tuttle & Bailey, Inc., New Britain, Conn.
- Airlock**—Mineral Wool. Plastergon Wall Board Co., Buffalo.
- Air-Marvel**—Fans. General Blower Co., Philadelphia, Pa.
- Airmat**—Filters. American Air Filter Co., Inc., Louisville, Ky.
- Airmover**—Blowers. Skuttle Sales Co., Detroit.
- Air-O-Matic**—Air Conditioning Units. Williams Oil-O-Matic Htg. Corp., Bloomington, Ill.
- Airo-Flex**—Registers. Auer Register Co., Cleveland.
- Airotor**—Blower Wheels. Torrington Mfg. Co., Torrington, Conn.
- Air-Pak**—Blower-Filter Units. Air Controls, Inc., Cleveland.
- Airplex**—Filters. Davies Air Filter Corp., New York, N. Y.
- Airpyrator**—Blowers. Burnwell Corp., Allentown, Pa.
- Airseal**—Insulation. Rock Wool Products Co., Inc., Wabash, Ind.
- Air-Seel**—Oil Burners. Silent Glow Oil Burner Corp., Hartford, Conn.
- Airstat**—Controls. Minneapolis-Honeywell Regulator Co., Minneapolis.
- Airstream**—Blower Wheels. Morrison Products, Inc., Cleveland.
- Air-Van**—Roof Ventilators. Gallaher Co., Owatonna, Minn.
- Air-Vane**—Registers. Rock Island Register Co., Rock Island, Ill.
- Airvulc**—Concrete Waterproofing Paint. Self-Vulcanizing Rubber Co., Inc., Chicago, Ill.
- Ajax**—Prefabricated Ducts, Fittings, Metal Shingles. Cincinnati Sheet Metal & Roofing Co., Cincinnati.
- Akron Air Blast**—Furnaces. May-Fiebeger Co., Newark, Ohio.
- Albron**—Aluminum Paint. Aluminum Company of America, Pittsburgh.
- Alcoa**—Aluminum Products. Aluminum Co. of America, Pittsburgh, Pa.
- All-Alloy**—Shears. Bremil Mfg. Co., Erie, Pa.
- Allen-Flux**—Soldering Flux. L. B. Allen Co., Chicago.



**Allkote**—Paint. Acme Refining Co., Cleveland.

**All-Metal**—Solder. McNamee Products, Glencoe, Ill.

**All-Season**—Air Conditioning Units. Fedders Mfg. Co., Buffalo.

**All-Sol**—Flux. L. B. Allen Co., Chicago.

**Alltite**—Insulation. Coast Insulating Corp., Los Angeles.

**Allvent**—Window Ventilating Fans. Autovent Fan & Blower Div., Herman Nelson Corp., Chicago.

**All-Weather**—Roof Cement, Caulking and Waterproofing Compounds, Roofing Paint. Ford Roofing Products Company, Chicago.

**Alma**—Furnace Brushes. Worcester Brush & Scraper Co., Worcester, Mass.

**Almar**—Hand Slitting Machines. Ward Machinery Co., Chicago, Ill.

**Almetal**—Fire Doors. Merchant & Evans Co., Philadelphia, Pa.

**Alnor**—Thermometers. Illinois Testing Laboratories, Inc., Chicago, Ill.

**Alumaweld**—Flux and Solder. Lloyd S. Johnson Co., Chicago.

**Alumbrite**—Paint. Thompson & Co., Pittsburgh, Pa.

**Alumi-Flux**—Soldering Flux. L. B. Allen Co., Chicago, Ill.

**Alumilite**—Aluminum Venetian Blinds. Chicago Venetian Blind Co., Chicago.

**Aluminweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

**Alumi-Solder**—Aluminum Solder. L. B. Allen Co., Chicago.

**Always Reliable**—Soldering Furnaces, Mallets, Torches. Otto Bernz Co., Inc., Rochester, N. Y.

**Ambrac**—Welding Rod. American Brass Co., Waterbury, Conn.

**Amco**—Flux. American Solder & Flux Co., Philadelphia, Pa.

**Amerock**—Cabinet and Casing Hardware. American Cabinet Hardware Corp., Rockford, Ill.

**Aminco**—Anemometers. American Instrument Co., Silver Spring, Md.

**Amirglass**—Air Filters. Amirton Co., Elmsford, N. Y.

**Anaconda**—Copper and Brass Products. American Brass Co., Waterbury, Conn.

**Anchor**—Hangers. Royal-Apex Mfg. Corp., Brooklyn, N. Y.

**Anchor**—Roofing Paint. A. Wilhelm Co., Reading, Pa.

**Anchor Brand**—Nails, Rivets. Townsend Co., New Brighton, Pa.

**Anchor-Kolstoker**—Stoker-fired Furnaces and Stokers. Anchor Stove & Range Co., New Albany, Ind.

**Anderson**—Spray Nozzles. B. F. Sturtevant Co., Hyde Park, Mass.

**Anode**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

**Antoxide**—Metal Protecting Paint. du Pont de Nemours & Company, Wilmington, Del.

**Apartment**—Window Ventilating Fans. Autovent Fan & Blower Div., Herman Nelson Corp., Chicago.

**Apco**—Caulking Compounds, Paint. Asphalt Products Co., Syracuse, N. Y.

**Apex**—Furnaces. Excelsior Steel Furnace Co., Chicago.

**Apex**—Furnaces & Heaters. Dallman Supply Co., Sacramento, Cal.

**Apex**—Quadrants. Ohio Products Co., Cleveland, O.

**Apex**—Hangers. Elbows and Fittings. Royal-Apex Mfg. Co., Brooklyn.

**Apex Exl-Air**—Furnaces. Excelsior Steel Furnace Co., Chicago.

**Appoloy**—Copper Steel. Apollo Steel Company, Apollo, Pa.

**Appton Super**—Pneumatic Hammer. Brown-Appton Company, New York City.

**Aqua Bar**—Roof Cement. Continental Products Co., Euclid, O.

**Aqua-Flo**—Pumps. The Heil Co., Milwaukee.

**Aqua-Master**—Water Heaters. Century Eng. Corp., Cedar Rapids, Ia.

**Aqua-Scale**—Automatic Humidifier. J. P. Glasby Mfg. Co., Bloomfield, N. J.

**Aqualux**—Water Heaters. S. T. Johnson Co., Oakland, Cal.

**Aro-Eng**—Air Conditioning Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.

**Arcmaster**—Arc Welders. Bear Mfg. Co., Rock Island, Ill.

**ArcoFlame**—Oil Burners. American Rad. & Standard Sanitary Corp., Pittsburgh, Pa.

**Arctic**—Air Conditioning Units. Premier Furnace Co., Dowagiac, Mich.

**Arex-Austor**—Ventilators. Arex Company, Chicago.

**Arlin Accelerant**—Louvers and Shutters. Arex Co., Chicago.

**Arlin Stationary**—Louvers and Shutters. Arex Co., Chicago.

**Aristocrat**—A. C. Furnaces. Henry Furn. & Fdy. Co., Cleveland.

**Aristocrat**—Registers. Auer Register Co., Cleveland, O.

**Armco**—Plates, Sheets. American Rolling Mill Co., Middletown, O.

**Armco Ingot Iron**—Iron Roofing and Sheets. American Rolling Mill Co., Middletown, O.

**Armorize**—Paint. Carter Paint Co., Liberty, Ind.

**Armstrong**—Compressors. General Machinery Co., Spokane, Wash.

**Arrow**—Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.

**Arrow**—Ventilators. Uno Ventilator Co., Cliftondale, Mass.

**Arrowtrol**—Heating and Ventilating Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.

**Artcraft**—Furnace Blowers. Chicago Steel Furnace Co., Chicago, Ill.

**Asbestocel**—Furnace Insulation. Johns-Manville, New York City.

**Asco**—Relays, Switches, Valves. Automatic Switch Co., New York, N. Y.

**Ath-A-Nor**—Furnaces. May-Flebeiger Co., Newark, Ohio.

**Atlantic Breeze**—Kitchen Exhaust Fans. Pryne & Co., Inc., Los Angeles.

**Atomist**—Humidifiers. American Foundry & Furnace Co., Bloomington, Ill.

**Attie Louvers**—Ventilators. Air Control Products, Inc., Coopersville, Mich.

**Auto**—Humidifier Valves. Maid-O'-Mist, Inc., Chicago.

**Autocrat**—Fan Blades. Torrington Mfg. Co., Torrington, Conn.

**Autocrat**—Furnaces and Oil Burners. Chandler Company, Cedar Rapids, Iowa.

**Automatic**—Air Conditioning Furnaces. Premier Furnace Co., Dowagiac, Mich.

**Automatic June**—Humidifiers. Monmouth Products Company, Cleveland.

**Aviation**—Snips. Penn Tool Co., Philadelphia.

**Axiom**—Filters. Blocksom & Company, Michigan City, Ind.

## B

**BB**—Blast Gates, Roof Clips, Damper Clips and Tips, Conductor Fittings and Accessories, Snow Guards. Berger Brothers Company, Philadelphia.

**BCA**—Ball Bearings. Bearing Co. of America, Lancaster, Pa.

**BE**—Air Conditioning Units, Blowers, Blower-Filters, Fans. Barrett Engineers, Cleveland Heights, O.

**B. F. C.**—Gas Burners. Moncrief Furnace & Mfg. Co., Dallas, Tex.

**B-H**—Insulating Cement. Baldwin-Hill Co., Trenton, N. J.

**B-W**—Relays, Switches. Bender Warwick Corp., Birmingham, Mich.

**B & W**—Refractories & Stokers. Babcock & Wilcox Co., New York City.

**Badger**—Time Switches. Reliance Automatic Lighting Co., Racine, Wis.

**Baers**—Enamels, Lacquers and Paint. Baer Brothers New York City.

**Ballard**—Oil Burners and Furnaces. Gilbert & Barker Mfg. Co., Springfield, Mass.

**Balsam-Wool**—Flexible Insulation. Wood Conversion Co., St. Paul.

**Bankheat**—Oil Burners. S. T. Johnson Co., Oakland, Cal.

**Bantam**—Motors. Small Motors, Inc., Chicago.

**Bar-Brook**—Fans, Heaters. Shreveport Eng. Co., Inc., Shreveport, La.

**Bardamp**—Waterproofing Compounds. Acorn Refining Company, Cleveland.

**Barlastic**—Caulking Compounds. Barland Weatherstrip Material Co., Cleveland.

**Barreled Sunlight**—Paint and Enamel. U. S. Gutta Percha Paint Co., Providence, R. I.

**Barry**—Pillow Blocks, Pulleys. R. & J. Dick Co., Inc., Passaic, N. J.

**Barthel**—Soldering Furnaces and Torches. Van Praag Sales, New York City.

**Barton**—Blower-Filters, Furnace Blowers, Cabinets and Casings, Air Conditioning and Gravity Furnaces, Heaters, Housings and Stampings. National Mfg. & Engineering Co., Detroit.

**Basmor**—Air Conditioning Furnace. Bastian-Morley Co., Inc., LaPorte, Ind.

**Battery**—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.

**Bear Cat**—Booster Fans. Midwestern Supply Co., Chicago.

**Beaver**—Furnaces and Heaters. Danville Stove & Mfg. Co., Danville, Pa.

**Beckett Commodore**—Oil Burners. R. W. Beckett Eng. Co., Elyria, O.

**Beehive**—Roofing. Samuel Cabot, Inc., Boston, Mass.

**Beloit**—Machines, Punches, Tools. Hendley & Whittemore Co., Beloit, Wis.

**Bemis**—Furnace Brushes. Worcester Brush & Scraper Co., Worcester, Mass.

**Benco**—Oil Burners. Bennett Co., Omaha, Nebr.

**Bend-Ezy**—Grilles and Registers. Standard Stamping & Perforating Co., Chicago.

**Bengal**—Furnaces. Floyd-Wells Co., Ryersford, Pa.

**Bennett-Alison**—Oil Burners. Bennett Co., Omaha, Nebr.

**Berloy**—Building Products. Berger Mfg. Co., Div. Republic Steel Corp., Canton, O.

**Berry-Cel**—Insulation. F. E. Berry & Co., Everett, Mass.

**Bertossa**—Furnaces. Parker Heating & Manufacturing Co., St. Petersburg, Fla.

**Best**—Cast Iron Chimney Caps. Sterling Foundry Co., Sterling, Ill.

**Beth-Cu-Loy**—Sheets. Bethlehem Steel Co., Bethlehem, Pa.

**Bethlehem Doe**—Oil Burners. Bethlehem Fdy. & Mach. Co., Bethlehem, Pa.

**Bettendorf**—Oil Burners. Micro-Westco Inc., Bettendorf, Iowa.

**Betterbuilt** — Registers. Air Control Products, Inc., Coopersville, Mich.

**Big Sioux** — Furnaces. Iowa Foundry Co., Sioux City, Iowa.

**Biltwel** — Furnaces. Fraser & Johnston Co., San Francisco.

**Bitugloss** — Enamels & Lacquers. Walles Dove-Hermiston Corp., Westfield, N. J.

**Bituseal** — Paint. Cheesman-Elliott Co., Inc., Brooklyn.

**Black Diamond** — Built-up Roofing. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

**Black Diamond** — Furnaces, Heaters. Maple City Furnace Co., Monmouth, Ill.

**Black Diamond** — Stokers. Beckley Perforating Co., Garwood, N. J.

**Blo-Aire** — Blower-Filter Units. Meyer Furnace Co., Peoria, Ill.

**Blowertrol** — Thermostatic Hydraulic Control. White Mfg. Co., St. Paul.

**Blowette** — Blower-Filter Units. Lau Blower Co., Dayton, Ohio.

**Blue Flame** — Rotary Oil Burners. Silent Glow Oil Burner Corp., Hartford, Conn.

**Blu-Fan** — Kitchen Exhaust Fans. Pryne & Co., Inc., Los Angeles.

**Blue Knight** — Enamels and Lacquers. Roxalin Flexible Lacquer Co., Elizabeth, N. J.

**Blue-Point** — Drills, Tools. Snap-on Tools Corp., Kenosha, Wis.

**Boiler Plate** — Furnaces. Williamson Heater Co., Cincinnati, O.

**Boomer** — Furnaces, Heaters. Hess-Snyder Co., Massillon, O.

**Boost-Aire** — Fans. L. J. Mueller Furnace Co., Milwaukee.

**Bower** — Bearings. Ahlberg Bearing Co., Chicago.

**Branford** — Oil Burners. Malleable Iron Fittings Co., Branford, Conn.

**Brees-Air** — Fans. Buffalo Forge Co., Buffalo, N. Y.

**Breeze** — Oil Burners. Columbus Metal Products, Inc., Columbus, O.

**Breeze** — Kitchen Exhaust Fans. Buffalo Forge Co., Buffalo, N. Y.

**Brevolite** — Crackle Finish Paint. Zapon-Brevolite Division Atlas Powder Co., North Chicago, Ill.

**Brilliant Fire** — Floor Furnaces and Heaters. Ohio Foundry and Mfg. Co., Steubenville, O.

**Brookcell** — Metal Ceilings. Brooklyn Metal Ceiling Co., Brooklyn, N. Y.

**Bull Dog** — Snips and Shears. Wiss & Sons Co., Newark, N. J.

**Bung-Lo** — Warm Air Furnaces. Geo. J. Cocking, Santa Ana, Cal.

**Bunker Hill** — Roofing, Sheets and Solder. Northwest Lead Co., Seattle, Wash.

**Burke** — Pumps. Decatur Pump Co., Decatur, Ill.

**Burner-Set** — Plibrico Jointless Firebrick Co., Chicago.

**Burnham** — Pumps. Union Steam Pump Co., Battle Creek, Mich.

**Butler** — Furnaces. Ramey Mfg. Co., Columbus, O.

**Butler** — Stokers. Eddy Stoker Corporation, Chicago.

**But-N-tite** — Steel Roofing. St. Paul Corrugating Co., St. Paul.

**Buzzer** — Gas Soldering Furnaces. Charles A. Hones, Inc., Baldwin, N. Y.

## C

**CDC** — Bearings, Couplings, Pulleys. Chicago Die Casting Company, Chicago.

**C-H** — Relays, Switches and Valves. Cutler-Hammer, Inc., Milwaukee, Wis.

**CID** — Pumps. Goulds Pumps, Inc., Seneca Falls, N. Y.

**C J B** — Bearings. Ahlberg Bearing Co., Chicago.

**CP** — Electric Tools. Chicago Pneumatic Tool Co., New York City.

**C-10** — High Temperature Paint. Laclede-Christy Clay Products Co., St. Louis.

**Cal Cor** — Eaves Trough and Gutters, Louvers and Shutters, Damper Quadrants, and Skylight Lifts. California Cornice, Steel and Supply Corp., Los Angeles.

**Calktite** — Caulking Compounds. U. S. Stoneware Co., Akron, Ohio.

**Calorio** — Furnaces. Marshall Furnace Co., Marshall, Mich.

**Calorider** — Air Conditioning Units. General Air Conditioning Corp., Cincinnati.

**Calwico** — Wire Cloth. California Wire Cloth Corp., Oakland, Cal.

**Camel** — Valves. C. L. Bryant Corp., Cleveland, O.

**Cantilever** — Hygrometers. Standard Thermometer, Inc., Boston.

**Capital** — Furnaces. Farris Furnace Co., Springfield, Ill.

**Capitol Rock Wool** — Cement and Insulation. Standard Lime & Stone Co., Baltimore.

**Capitolaire** — Furnaces. United States Radiator Corp., Detroit.

**Carbonaire** — Oil Burners. Aldrich Co., Wyoming, Ill.

**Careycel** — Insulation. Philip Carey Co., Cincinnati, O.

**Careyclad** — Metal Protecting Paint. Philip Carey Mfg. Co., Cincinnati.

**Careyduct** — Prefabricated Ducts and Fittings. Philip Carey Co., Cincinnati, Ohio.

**Carter** — Oil Burners. General Oil Heating Corp., West New York, N. J.

**Carton Economy** — Furnaces. International Heater Co., Utica, N. Y.

**Cascade** — Desert Coolers. Todd Air Conditioning Co., Inc., Bonner Springs, Kansas.

**Castable** — Furnace Insulation. Munn and Steele, Inc., Newark, N. J.

**Castalu** — Blower Wheels and Fans. Advance Aluminum Castings Corp., Chicago, Ill.

**Caulk-O-Seal** — Caulking and Glazing Compounds. Calbar Paint & Varnish Co., Philadelphia, Pa.

**Cauxeal** — Compounds. X-Pando Corporation, Long Island City, N. Y.

**Cello-Sponge** — Evaporators. Viking Air Conditioning Corp., Cleveland.

**Cell-U-Blanket** — Insulation. Masonite Corp., Chicago.

**Cel-Lux** — Insulation. Norristown Magnesia & Asbestos Co., Norristown, Pa.

**Cementico** — Concrete Waterproofing Paint. United States Gypsum Co., Chicago.

**Cementseal** — Enamels & Paint Acorn Refining Co., Cleveland.

**Cementite** — Paint. Thompson & Co., Pittsburgh, Pa.

**Cementkote** — Paint. Tropical Paint & Oil Co., Cleveland, O.

**Cempro** — Concrete Paint. Asphalt Products Co., Syracuse, N. Y.

**Centripeller** — Ventilating Fans. Paul R. Jordan & Co., Inc., Indianapolis.

**Certi-Fire** — CO<sub>2</sub> Analyzers. Westinghouse Electric & Mfg. Co., Springfield, Mass.

**Challenger** — Domestic Stokers. Link Belt Co., Chicago.

**Challenger** — Stokers. Kol-Master Corp., Oregon, Ill.

**Chamberlin** — Automatic Humidifier. Chandler Co., Cedar Rapids, Ia.

**Champion** — Furnaces. Wheeling Furnace Corp., Martins Ferry, Ohio.

**Charavay** — Fans. Hartzell Propeller Fan Co., Piqua, O.

**Checker Coat** — Galvanized Steel Sheets. Superior Sheet Steel Co. Div. Continental Steel Corp., Canton, O.

**Chicago** — Brakes and Presses. Dreis & Krump Mfg. Co., Chicago, Ill.

**Chicastic Castable** — Refractory. Chicago Fire Brick Co., Chicago, Ill.

**Chico Brickset** — High Temperature Cement. Chicago Fire Brick Co., Chicago, Ill.

**Chief** — Furnaces. Joliet Heating Corp., Joliet, Ill.

**Chieftan** — Furnaces. Round Oak Company, Dowagiac, Mich.

**Chieftain** — Refrigerating Compressors. Tecumseh Products Co., Tecumseh, Mich.

**Chinook** — Heating Coils. Bayley Blower Co., Milwaukee, Wis.

**Chinookfin** — Heating Coils. Bayley Blower Co., Milwaukee, Wis.

**Chromeweld** — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

**Chromio** — Refractories. Refractory & Insulation Corp., New York City.

**Chromium 173 Silver** — Aluminum Paint. C. H. Dragert Company, Inc., Brooklyn.

**Chromlead** — Enamels and Lacquers. Dragert Co., C. H., Inc., Brooklyn.

**Chronat** — Furnace and Boiler Repairs. National Fdry. & Furnace Co., Dayton, O.

**Chronotherm** — Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

**Chrysler-Airtemp** — Heating and Cooling Equipment. Airtemp Div., Chrysler Corp., Dayton, Ohio.

**Circo** — Louvers & Shutters. Circulators & Devices Mfg. Corp., New York City.

**CirCOOLator** — Fans and Ventilators. Viking Air Conditioning Corporation, Cleveland, O.

**Circulaire** — Heaters. J. V. Patten Co., Sycamore, Ill.

**Clason** — Snow Guards. M. N. Cartier & Sons Company, Providence, R. I.

**Class 60** — Fuel Oil Pumps. Kraissl Company, Inc., Hackensack, N. J.

**Classic** — Registers. Auer Register Co., Cleveland, O.

**Clean-Aire** — A. C. Furnaces — Harvey-Whipple, Inc., Springfield, Mass.

**Clean Air** — Register Shields. Swing-a-Way Steel Products, Inc., Chicago.

**Cleanaire** — Blower-Filters. Peerless Foundry Co., Indianapolis, Ind.

**Cleveland** — Furnaces. Dornback Furnace & Fdy. Co., Cleveland.

**Climate-Changer** — Air Conditioning Units. Trane Co., La Crosse, Wis.

**Climate Master** — Oil Burning Air Conditioning Furnace. Hess Warming & Ventilating Co., Chicago, Ill.

**Climator** — Blower-Filter Units. L. J. Mueller Furnace Co., Milwaukee.

**Clincher** — Conductor Fittings and Accessories. Milcor Steel Co., Milwaukee.

**Clinton** — Grilles. Wickwire Spencer Steel Co., New York City.

**Clipper** — Stokers. Conco Corp., Mendota, Ill.

**Coal Master** — Stoker-fired Furnace. Round Oak Co., Dowagiac, Mich.

**Cog-Belts** — V-type Belts. Dayton Rubber Mfg. Co., Dayton, Ohio.

**Colalloy** — Light Weight Shapes, Plates. Colonial Alloys Co., Philadelphia.

**Coldstream** — Air Conditioning Units. Baker Ice Machine Company, Inc., Omaha, Nebr.

**Collopakes** — Roofing Paint. Samuel Cabot, Inc., Boston.

**Colonial** — Blower-Filters, Oil Burners, Furnaces, Humidifiers, Heaters, Stokers. Green Colonial Furnace Co., Des Moines, Ia.



**Colonial**—Conductor Heads and Fittings. Royal-Apex Mfg. Corp., Brooklyn.

**Colonial**—Registers. Auer Register Co., Cleveland, O.

**Colortip**—Arc Welding Electrodes. Wilson Welder & Metals Co., Inc., New York City.

**Columbus**—Humidifiers. Fred D. Pfening Co., Columbus, Ohio.

**Columbus**—Ventilators. F. O. Schoedinger Co., Columbus, O.

**Combustioneer**—Stokers. Steel Products Engineering Co., Springfield, O.

**Comet Exhaustair**—Fans and Ventilators. New York Blower Co., Chicago, Ill.

**Comfort**—Furnaces. J. B. Foote Foundry Co., Fredericktown, O.

**Comfort**—Furnaces. May-Fieberger Company, Newark, Ohio.

**Comfort Air**—Blower-Filter Units and Humidifiers. Comfort Products Corporation, Harvey, Ill.

**Comfortaire**—Stokers. Hamilton Automatic Stoker Corp., Hamilton, O.

**Comfortmaker**—Furnaces. Joliet Heating Corp., Joliet, Ill.

**Comfortrol**—Blowers and Blower Units, Furnaces. Waterman-Waterbury Co., Minneapolis.

**Comfortrol**—Effective Temperature Control. Julien P. Friez & Sons, Baltimore.

**Comfortsone**—Furnaces. Michigan Tank & Furnace Corp., Detroit.

**Co-Min-Co**—Insulating Cement. United States Mineral Wool Co., Chicago.

**Compact**—Blowers. Bishop & Babcock Mfg. Co., Cleveland, O.

**Compact**—Oil Burners. The Aldrich Co., Wyoming, Ill.

**Compactaire**—Air Conditioning Furnaces. Glasby Mfg. Co., Inc., J. P., Bloomfield, N. J.

**Condor**—Belts. Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., Passaic, N. J.

**Coni-Vane**—Ventilators. Allen Corp., Detroit.

**Control-O-Gas**—Valves. Payne Furnace & Supply Co., Beverly Hills, Cal.

**Controlaire**—Furnaces. St. Louis Furnace Mfg. Co., St. Louis.

**Convectair**—Furnaces. L. J. Mueller Furnace Co., Milwaukee, Wis.

**Convectair**—Humidifiers. Maid-O'-Mist, Inc., Chicago.

**Convert**—Gas Burners. Columbia Burner Company, Toledo, Ohio.

**Coolair**—Blowers, Fans and Ventilators. American Coolair Corp., Jacksonville, Fla.

**Coolerair**—Air Conditioning Units. Payne Furnace & Supply Co., Beverly Hills, Cal.

**Coolvent**—Attic Fans. Autovent Fan & Blower Div., Herman Nelson Corp., Chicago.

**Copperkote**—Waterproofing. Cheney Co., Ardmore, Pa.

**Copperior**—Sheets. Superior Sheet Steel Co., Canton, O.

**Cop-B-Loy**—Copper Bearing Steel Sheets. Wheeling Corrugating Co., and Wheeling Steel Corp., Wheeling, W. Va.

**Copruf**—Roofing. Copper Roofs Corporation, Milwaukee.

**Copruf Valley**—Flashings. Copper Roofs Corporation, Milwaukee.

**Corinco**—Insulation. Cork Insulation Co., Inc., New York, N. Y.

**Corkboard**—Insulation. Armstrong Cork Co., Lancaster, Pa.

**Corona**—Dust Separator and Collector. Clark Dust Control Company, Chicago.

**Counterflow**—Air Conditioning Furnaces. Western Blower Co., Seattle.

**Crane Basmor**—Bastian-Morley Co., Inc., LaPorte, Ind.

**Crescent**—Furnaces. Green Colonial Furnace Co., Des Moines, Ia.

**Crescent**—Oil Burners. Caloroll Burner Corp., Hartford, Conn.

**Crestoloy**—Tools. Crescent Tool Co., Jamestown, N. Y.

**Crescent**—Skylights, Ventilators. American Sheet Metal Works, New Orleans, La.

**Crucibleweld**—Arc Welding Electrodes. Westinghouse Electric & Mfg. Co., East Pittsburgh.

**Crusader**—Oil Burners. Bethlehem Fdry. & Mach. Co., Bethlehem, Pa.

**Crystal**—Crackle Finish Paint. Hilo Var-nish Corp., Brooklyn.

**Custom-Aire**—Furnaces and Heaters. Heating Equipment Co., San Francisco.

**D**

**D&E**—Vacuum Furnace Cleaners, Stokers. Dickson Coal Co., New York City.

**D-Q**—Furnace Vacuum Cleaners. Densmore-Quinlan Co., Kenosha, Wis.

**Dallaire**—Blower-Filters, Furnaces, Heaters, Humidifiers. McLouth Air Conditioning Corp., Lansing, Mich.

**Dakota**—Oil Burners. Fargo Foundry Co., Fargo, N. D.

**Dalzan**—Gas Burners. H. A. Hudson, Buffalo.

**Da-Nite**—Acratherm. Minneapolis-Honeywell Reg. Co., Minneapolis.

**Day-Nite**—Thermostat. Penn Electric Switch Co., Goshen, Ind.

**Daptoblu**—Gas Burners. Beck Engineering Combustion Company, St. Louis.

**Deco**—Metal Shingles. Cincinnati Sheet Metal & Roofing Co., Cincinnati.

**Decoseal**—Aluminum Paint. Debevoise Co., Brooklyn, N. Y.

**Defender**—Oil Burners. Silent Glow Oil Burner Corp., Hartford, Conn.

**Deflecto**—Ventilators. The Day Co., Minneapolis, Minn.

**Deflectrol**—Duct Turning Vanes. Barber-Colman Co., Rockford, Ill.

**Degraco**—Enamels, Lacquers and Paints. Detroit Graphite Co., Detroit.

**Dehydrantline**—Waterproofing. A. C. Horn Co., Long Island City.

**Delco-Heat**—Oil Burners, Furnaces, Motors, Pumps and Stokers. Delco Appliance Div., General Motors Sales Corp., Rochester, N. Y.

**DeLuxo**—Air Conditioning Furnaces. Williamson Heater Co., Cincinnati.

**DeLuxo**—Gravity Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.

**DeLuxo**—Heaters. Agricola Furnace Co., Inc., Gadsden, Ala.

**Dens-Pac**—Asbestos Cement. Norristown Magnesia & Asbestos Co., Norristown, Pa.

**Deoxidine**—Metal Protecting Paint. American Chemical Paint Co., Ambler, Pa.

**Dependable**—Paint. Heath & Milligan Mfg. Co., Chicago, Ill.

**De-Pollitizer**—Window Ventilator and Filter Units. Todd Air Conditioning Co., Inc., Bonner Springs, Kan.

**Dereks**—Paint. Debevoise Co., Brooklyn, N. Y.

**De-Sta-Co**—Blower Housings. Detroit Stamping Co., Detroit.

**Detroit LoStoker**—Stokers. Detroit Stoker Co., Detroit and Monroe, Mich.

**Detroit UniStoker**—Stokers. Detroit Stoker Co., Detroit and Monroe, Mich.

**Dew-Aire**—Air Conditioning Units. Standard Computing Scale Co., Detroit.

**Dexter Heat Valve**—Ridge Ventilators. Swartwout Co., Cleveland.

**Dial-Set**—Stokers. Kol-Master Corp., Oregon, Ill.

**Diamond**—Compounds, Enamels, Lacquers and Paint. Thompson & Co., Pittsburgh, Pa.

**Diamond**—Smoke Pipe Dampers. Adams Company, The, Dubuque, Ia.

**Diamond H**—Controls, Relays, Switches. Hart Mfg. Co., Hartford, Conn.

**Dickinson**—Ventilators. Aeolus Dickinson, Chicago, Ill.

**Dickrope**—V-type Belts. R. & J. Dick Co., Passaic, N. J.

**Directaire**—Air Conditioning Furnaces. Fitzgibbons Boiler Co., Inc., New York City.

**Directerm**—Furnaces. Airtherm Mfg. Co., St. Louis.

**Dixigas**—Gas Welding Rod. Atlantic Steel Co., Atlanta, Ga.

**DixiPeer**—Electrodes. Atlantic Steel Co., Atlanta, Ga.

**Dixisteel**—Angles, Bars, Channels, Rivets, Wire. Atlantic Steel Co., Atlanta, Ga.

**Do-All**—Combination Hammer and Drill. Wodack Electric Tool Corp., Chicago.

**Doall**—Buffers, Grinders, Polishers & Sanders. Continental Machines Incorporated, Minneapolis.

**Doall Metalmaster**—Contour cutting saw and Stampings. Continental Machines Incorporated, Minneapolis.

**Dorex**—Odor Adsorbers. Dorex Air Conditioning Div., W. B. Connor Eng. Corp., New York City.

**Dorwil**—Utility Room Furnaces. Gibraltar Engineering Co., Los Angeles.

**Double Diamond**—Humidistats, Psychrometers, Relays, Switches, Thermometers. H-B Instrument Company, Philadelphia, Pa.

**Double-Duty**—Oil Burners. Aldrich Co., Wyoming, Ill.

**Double-Lock**—Roofing. Copper Roofs Corporation, Milwaukee.

**Double-Seal**—Humidifier Fittings. Hays Mfg. Co., Erie, Pa.

**Dover**—Hangers. Reeves Steel & Mfg. Co., Dover, Ohio.

**Dover-Imperial**—Eaves Trough Hangers. Ohio Wire Products Co., Dover, O.

**Draftmaster**—Regulators. Platt Products Corp., Lansing, Mich.

**Draft-O-Stat**—Draft Regulators and Smoke Pipe Dampers. Hotstream Heater Company, Cleveland.

**Drafrite**—Draft Gages. Bacharach Industrial Instrument Co., Pittsburgh.

**Dreadnaught**—Soldering Torches and Furnaces. P. Wall Mfg. Supply Co., N. S. Pittsburgh.

**Drifilter**—Filters. American Air Filter Co., Inc., Louisville, Ky.

**Dri-Lap**—Roofing. Globe Iron Roofing & Corrugating Co., Newport, Ky.

**Dri-N-Tite**—Cement. A. C. Horn Co., Long Island City, N. Y.

**Drival**—Waterproofing Compound. The Glidden Co., Cleveland.

**Dual-Clone**—Blow Pipe Collectors. Day Co., Minneapolis.

**Dubblseal**—Sheathing. Masonite Corp., Chicago.

**Duckseal**—Waterproofing Compound. Acorn Refining Co., Cleveland.

**Duco**—Enamels and Lacquers. E. I. du Pont de Nemours & Co., Wilmington, Del.

**Ducon**—Controls. Dual Remote Control Co., Wayne, Mich.

**Ducturns**—Vanes. Tuttle & Bailey, Inc., New Britain, Conn.

**Ductype**—Blowers. South Bend Air Products, Inc., South Bend, Ind.



**Dukrome**—Metal Protecting Paint. du Pont de Nemours & Co., Wilmington, Del.

**Dulux**—Enamels, Lacquers and Paints. E. I. du Pont de Nemours & Co., Wilmington, Del.

**Dunco**—Relays, Switches, Thermostats. Struthers Dunn, Inc., Philadelphia.

**Duoform**—Air Conditioning Units. Clarage Fan Co., Kalamazoo, Mich.

**Duplex**—Flashings. Chase Brass & Copper Co., Incorporated, Waterbury, Conn.

**Dura**—Furnaces, Heaters. Barry Furnace Co., Hamilton, O.

**Dura-A-Ble**—Furnaces. St. Louis Furnace Mfg. Co., St. Louis.

**Dura-Bilt**—Registers. Auer Register Co., Cleveland, Ohio.

**Dura-Flex**—Directional Flow Registers. Auer Register Co., Cleveland.

**Dura-Line**—Registers. Auer Register Co., Cleveland.

**Durastac**—Chimney Liners. Skuttle Sales Co., Detroit.

**Dura-Steel**—Registers. Middleton Mfg. & Sales Co., Minneapolis.

**Duratite**—Glazing Compounds. Tropical Paint & Oil Co., Cleveland.

**Durex**—Bearings. General Motors Corp., Moraine Products Div., Dayton, Ohio.

**Duronze**—Sheets. Bridgeport Brass Co., Bridgeport, Conn.

**Duroplastic**—Caulking & Glazing Compounds. Acorn Refining Co., Cleveland.

**DustStop**—Filters. Owens-Corning Fiberglas Corp., Toledo, Ohio.

**Dux-Sulation**—Duct Insulation. Grant Wilson, Inc., Chicago, Ill.

**Dynaflow**—Blowers. South Bend Air Products, Inc., South Bend, Ind.

## E

**EDA**—Punches. Wiedemann Machine Company, Philadelphia.

**Eagle Deluxe**—Motors. Small Motors, Inc., Chicago.

**Eagle Star**—Solder. Eagle-Picher Lead Co., Cincinnati, Ohio.

**Eagle Super**—Insulating Cement and Flashing. Eagle-Picher Lead Co., Cincinnati, O.

**Eagle Tin-Loy**—Tinning Compounds. Eagle-Picher Lead Co., Cincinnati, Ohio.

**Earle**—Ventilators. Berger Bros. Co., Philadelphia, Pa.

**East Wind**—Window Fans. American Metal Products Co., Fort Worth, Tex.

**Easy**—Buffers, Grinders, Polishers and Sanders. Detroit Surfacing Machine Co., Detroit.

**Easy Bead**—Eaves Trough and Gutters. St. Paul Corrugating Co., St. Paul.

**Easy-Flo**—Solder. Handy & Harman, New York City.

**Easy-Slip**—Conductor Pipe. Eaves Trough and Gutters. La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.

**Economy**—Power Hack Saws. F. L. Robertson, Buffalo.

**Economy**—Furnaces, Heaters. International Heater Co., Utica, N. Y.

**Economy**—Adjustable Buffing Hoods. Kirk & Blum Mfg. Co., Cincinnati, O.

**Economy**—Registers. Auer Register Co., Cleveland, O.

**Economy**—Ventilators. Arex Company, Chicago.

**Econo-Therm**—Registers. Middleton Mfg. & Sales Co., Minneapolis.

**Edge Seal**—Filters. Wilson & Co., Inc., Chicago.

**Edgers**—Hand Flanging Machines. Packham Crimper Co., Mechanicsburg, Ohio.

**Efeco**—Louvers, Skylights, Ventilators. W. F. Hirschman Co., Inc., Buffalo.

**Elasticon**—Roofing Paint. A. C. Horn Co., Long Island City.

**Elastikote**—Paint. Tropical Paint & Oil Co., Cleveland, O.

**El Dryol**—Waterproofing Compound. Gerard Chemical Co., Elizabeth, N. J.

**Electric City**—Gutter Forming Machines. F. L. Robertson, Buffalo.

**Electric Filter Watchman**—Air Filter Gauge. Herbusch Corp., St. Louis.

**Electric Furnace Man**—Domestic Stoker. General Machine Co., Inc., Emmaus, Pa.

**Electric Janitor**—Controls and Regulators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

**Electrolaire**—Air Conditioning Furnaces. Electrol Incorporated, Clifton, N. J.

**Electro-Matic**—Filters. American Air Filter Co., Inc., Louisville, Ky.

**Electropump**—Water Circulating Pump. Weil Pump Company, Chicago.

**Electro-Sheet**—Roofing. American Brass Co., Waterbury, Conn.

**Electro Way**—Fans. Ward Mfg. Co., Plymouth, Mich.

**Electro-Wind**—Ventilators. Allen Corp., Detroit.

**Elgin**—Electric Torches. Borm Mfg. Co., Elgin, Ill.

**El Glykol**—Waterproofing Compound. Gerard Chemical Co., Elizabeth, N. J.

**Elite**—Registers. Auer Register Co., Cleveland, O.

**Eltum**—Duct Turning Vanes. Barber-Colman Co., Rockford, Ill.

**Emerson, Jr.**—Emerson Electric Mfg. Co., St. Louis.

**Empire**—Mallets. Greene, Tweed & Co., New York City.

**Enamel-Kote**—Enamels. Acme White Lead & Color Works, Detroit.

**Endurance**—Cement and Paint. Glidden Company, Cleveland.

**Enduro**—Sheets. Republic Steel Corp., Cleveland, O.

**Epcor**—Perforated Metals. Erdle Perforating Co., Rochester, N. Y.

**Equator**—Furnaces and Heaters. Lennox Furnace Co., Marshalltown, Iowa.

**Era**—Furnaces. Excelsior Steel Furnace Co., Chicago.

**Era Exl-Air**—Furnaces. Excelsior Steel Furnace Co., Chicago.

**Erco**—Flanging and Shrinking Machines, Power Punches. Engineering and Research Corporation, Riverdale, Md.

**Esco**—Smoke Pipe Dampers. Eselgroth & Co., Newark, N. J.

**Esico**—Electric Soldering Coppers and Furnaces. Electric Soldering Iron Co., Inc., Deep River, Conn.

**Esso**—Oil Burners, Furnaces. Gilbert & Barker Mfg. Co., Springfield, Mass.

**Eternium**—Paint. Barrett Div., Allied Chemical & Die Corp. New York City.

**Eureka**—Furnaces. Home Stove Co., Indianapolis, Ind.

**Evanair**—Oil Furnaces and Gas Heaters. Evanoll Heater Div., Evans Products Co., Detroit.

**Evansway**—Furnaces. George Evans Corp., Moline, Ill.

**Evco**—Valves. Electric Valve Mfg. Co., New York, N. Y.

**Everdur**—Plates, Sheets, Structural Shapes, Welding Rod. American Brass Co., Waterbury, Conn.

**Everjet**—Roofing Paint. Barrett Div., Allied Chemical & Die Corp., New York City.

**Everlast**—Furnaces. Pacific Gas Radiator Co., Los Angeles, Cal.

**Everwear**—Metal Cellings, Eaves Trough and Gutters with Fittings, Conductor Pipe, Ridge Rolls and Ridging, Roofing, Metal Shingles and Tile, Ventilators. Southern States Iron Roofing Co., Savannah, Ga.

**Ex-L-ite**—Sheets. Republic Steel Corporation, Cleveland.

**E-Z-On**—Damper Clips and Tips, and Damper Regulators. M. A. Gerett Co., Milwaukee.

## F

**F & D**—Refractories. General Insulating Products Co., Brooklyn.

**F & E**—Underfeed Stokers. Flynn & Emrich Co., Baltimore, Md.

**Fabrikated**—Grilles, Registers. Independent Register Co., Cleveland, O.

**Faceweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland.

**Falco**—Sheets. Fairmont Aluminum Co., Fairmont, W. Va.

**Famous**—Furnaces. Excelsior Steel Furnace Co., Chicago.

**Famous Exl-Air**—Air Conditioning Furnace. Excelsior Steel Furnace Co., Chicago.

**Far Quar**—Furnaces. Farquhar Furnace Co., Wilmington, O.

**Fastemp**—Furnaces. Norge Heating & Cond. Div., Detroit.

**Featherfin**—Colls. L. J. Wing Mfg. Co., New York, N. Y.

**Federal**—Refractories. U. S. Stoneware Co., Akron, Ohio.

**F Electric**—Fan Roof Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.

**Fenestra**—Heat Insulating Windows. Detroit Steel Products Co., Detroit.

**Fenn Rotary**—Roof Ventilators. Waverly Heating Supply Co., Boston.

**Ferrobord**—Steel Roofing. Truscon Steel Co., Youngstown, Ohio.

**Ferroclad**—Building Insulation. Truscon Steel Co., Youngstown, O.

**Ferrocrafft**—Grilles. Tuttle & Bailey, Inc., New Britain, Conn.

**Ferro-Therm**—Insulation. American Flange & Mfg. Co., Inc., New York.

**Ferroweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

**Fiberglas**—Insulation. Owens-Corning Fiberglas Corp., Toledo, Ohio.

**Filteraire**—Window Ventilator - filter units. Davies Air Filter Corp., New York City.

**Filtered Air**—Blower-Filters. American Foundry & Furnace Co., Bloomington, Ill.

**Filter-Shield**—Register Shields. Swing-a-Way Steel Products Inc., Chicago.

**Findlay**—Stokers. Bluffton Mfg. Co., Findlay, O.

**Fine Air**—Air Conditioning Units. Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit, Mich.

**Fin-Flex**—Registers. The Auer Register Co., Cleveland.

**Fin-Line**—Registers. The Auer Register Co., Cleveland.

**Firecrete**—Refractories. Johns-Manville, New York, N. Y.

**Firedaire**—Circulating Heaters. Edwards Mfg. Co., Inc., Cincinnati.

**Fire-Fixer**—Firing Tools. Farrell-Cheek Steel Co., Sandusky, Ohio.

**Fire-Hearth**—Refractories. Fireline Stove & Furnace Lining Co., Chicago.

**Fireite**—Cement. Johns-Manville, New York, N. Y.

**Fire-King**—Stokers. Sinker-Davis Co., Indianapolis, Ind.

**Fire Pilot** — Stoker Control. Sampsel Time Control, Inc., Spring Valley, Ill.

**Fire Tender**—Stokers. Holcomb & Hoke Mfg. Co., Indianapolis, Ind.

**Firezist**—Moldable Plastic Refractory. Laclede-Christy Clay Products Co., St. Louis.

**Firma**—Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.

**Fitchburg**—Oil Burners. E. W. Skinner Co., Fitchburg, Mass.

**Pitrite**—Conductor, Eaves Trough and Gutter Fittings and Accessories, Skylight Lifts, Snow Guards, Ventilators. David Levow, or Rival Strap Corp., New York City.

**Fitzgibbonsaire**—Air Conditioning Unit. Fitzgibbons Boiler Co., New York City.

**Fixit**—Cement. National Mfg. Corp., Tonawanda, N. Y.

**Flash-Rite**—Flashings. The Fidge Mfg. Co., Chicago, Ill.

**Flatjet**—Spray Nozzles. Spraying Systems Co., Chicago.

**Flat-Top**—Roofing. Globe Iron Roofing & Corrugating Co., Newport, Ky.

**Fleetweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

**Fleur de Lis**—Conductor Heads and Fittings. Royal-Apex Mfg. Corp., Brooklyn, N. Y.

**Flexair**—Registers and Grilles. Tuttle & Bailey, Inc., New Britain, Conn.

**Flexarc**—Arc Welders. Westinghouse Electric & Mfg. Co., East Pittsburgh.

**Flex-Bar**—Registers. United States Register Co., Battle Creek, Mich.

**"Flexiblac"**—Paint. Samuel Cabot, Inc., Boston.

**Flo-Co**—Furnaces. Floral City Co., Monroe, Mich.

**Floozy**—Solder. Merchant & Evans Co., Philadelphia, Pa.

**Flor-Aire**—Floor Furnaces. L. J. Mueller Furnace Co., Milwaukee.

**Flosol**—Flux. American Chemical Paint Co., Ambler, Pa.

**Plotrol**—Valves. Monmouth Products Co., Cleveland.

**Flo-Warm**—Coal, Oil, Gas and Stoker-Fired Furnaces. Williamson Heater Co., Cincinnati, Ohio.

**Flualyzer**—Portable CO<sub>2</sub> Analyzer. Chas. Engelhard, Inc., Newark, N. J.

**Follansbee**—Furnace Pipe. Sheet Metal Specialty Co., Pittsburgh.

**Forbes Syphonaire**—Ventilators. Western Engineering & Mfg. Co., Los Angeles.

**Forbes Tri-Feller**—Fans. Western Engineering & Mfg. Co., Los Angeles.

**Ford-V-Neer**—Building Insulation. Ford Roofing Products Co., Chicago.

**Forest Fleece**—Insulation. John J. Doherty Co., Belmont, Mass.

**Forstair Gas**—Circulating Heaters. Pernot & Rich, Inc., Los Angeles.

**Fosco**—Metal Ceilings, Skylights, etc. F. O. Schoedinger Co., Columbus, O.

**Foundation Coating** — Waterproofing. Glidden Co., Cleveland.

**Fracto - Crete** — Castable Refractory. Ramtite Co., Chicago.

**Franzite**—Enamels and Lacquers. Hilo Varnish Corp., Brooklyn, N. Y.

**Freedio**—Grilles. Trane Co., LaCrosse, Wis.

**Freeman**—Stokers. Illinois Iron & Bolt Co., Chicago, Ill.

**Freeport**—Oil Burners. Holtum Mfg. Co., Freeport, Ill.

**Friction Fighter**—Bearings. Link Belt Co., Chicago.

**Frigid**—Night Air Cooling and Exhaust Fans and Fan Blades. Circulators & Devices Mfg. Corp., New York City.

**Front End**—Paint. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

**Fros-T-Aire**—Air Conditioning Units. Palmers Manufacturing Corp., Phoenix, Ariz.

**Fulljet**—Spray Nozzles. Spraying Systems Co., Chicago.

**Fulscope**—Controls. Taylor Instrument Companies, Rochester, N. Y.

**Fulton**—Copper Paint. Debevoise Co., Brooklyn, N. Y.

**Fulton**—Register Shield with Humidifier. Patent Novelty Co., Fulton, Ill.

**Fyre-Chek**—Draft Regulators. Wisconsin Heating & Draft Control Co., Oshkosh, Wis.

**Fyr-feeder**—Stokers. American Coal Burner Company, Chicago, Ill.

**Fyrite**—CO<sub>2</sub> Analyzers. Bacharach Industrial Instrument Co., Pittsburgh.

**Fyr-Fly**—Oil Burners. The Aldrich Co., Wyoming, Ill.

## G

**G. B. C.**—Blowers and Fans. General Blower Co., Philadelphia.

**G-E**—Air Conditioning Units, Oil Burners, Compressors, Controls, Soldering Coppers, Couplings, Electrodes, Fans, Flux, Furnaces, Humidistats, Motors, Relays, Switches, Transformers, Solenoid Valves, Thermostats, Welders. General Electric Co., Bloomfield, N. J., and Schenectady, N. Y.

**G-M**—Grilles, Louvres, Shutters, Perforated Metals, Registers, Register Shields, Metal Stampings, Ventilators. Gillian Mfg. Co., Detroit.

**G. R.**—Air Conditioning Units, Window Ventilators and Filter Units. General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.

**Galvanide**—Metal Protecting Paint. A. C. Horn Co., Long Island City.

**Gal-va-nite**—Roof Cement, Waterproofing Compounds, Paint. Ford Roofing Products Co., Chicago.

**Gantz**—Furnace Lighter for Coal and Coke. American Furnace Lighter Sales Co., St. Louis.

**Garland**—Furnaces, Heaters. Detroit-Michigan Stove Co., Detroit.

**Gas-Era**—Furnaces. L. J. Mueller Furnace Co., Milwaukee, Wis.

**Gas King**—Furnaces. J. King Kent Co., St. Louis.

**Gas Miser**—Furnaces. Floral City Co., Monroe, Mich.

**Gastite** — Air Conditioners, Furnaces. Waterman-Waterbury Co., Minneapolis, Minn.

**Gas-Vac**—Furnaces and Heaters. Vacuum Gas Appliance Div., Union Fork & Hoe Co., Rome, N. Y.

**Gem**—Furnaces. Robinson Furnace Co., Chicago, Ill.

**Gem**—Soldering Furnaces. Burgess Soldering Furnace Co., Columbus, O.

**Gemaco**—Compressors. General Machinery Co., Spokane, Wash.

**Gen-Arc**—Arc Welders. General Equipment Co., Wichita, Kan.

**Genasco**—Cement, Compounds, Flashings, Paint, Asbestos Paper, Roofing. Barber Asphalt Corp., Barber, N. J.

**General**—Heaters, Agricola Furnace Co., Inc., Gadsden, Ala.

**General-Aire**—Fans. General Aire Company, Philadelphia.

**Generator**—Coils. Hotstream Heater Co., Cleveland, O.

**Genil**—Oil Burner. Nu-Way Corp., Rock Island, Ill.

**Genuine Detroit**—Controls, Humidistats, Motors, Relays, Switches, Thermostats and Transformers. Detroit Lubricator Co., Detroit, Mich.

**Giant**—Oil Burners. Aldrich Co., Wyoming, Ill.

**Gibraltar**—Furnace and Heaters. P. H. MaGill Foundry & Furnace Works, Bloomington, Ill.

**Gilbarco**—Blower-Filter Units, Furnaces, and Draft Regulators. Gilbert & Barker Mfg. Co., Springfield, Mass.

**Gilco**—Furnaces and Water Heaters. J. L. Gillen Co., Dowagiac, Mich.

**Gilt Edge**—Furnaces. Schwab Furnace Co., Milwaukee, Wis.

**Glazola** — Glazing Compounds. Nebel Mfg. Co., Cleveland.

**Globe**—Sheets. Newport Rolling Mill Co., Newport, Ky.

**Globe**—Ventilators. J. M. & L. A. Osborn Co., Cleveland.

**Globe Sizzler**—Hot Water Coils. Globe Machinery & Supply Co., Des Moines, Ia.

**Glo-Fyr**—Oil Burners. Aldrich Co., Wyoming, Ill.

**Glowan**—Gas Burners. J. O. & C. U. Martin, San Francisco.

**Gnome**—Oil Burners. Aldrich Co., Wyoming, Ill.

**Gohi**—Eaves Trough & Gutters, Pipe, Ridge Rolls and Ridging, Roofing. Globe Iron Roofing & Corrugating Co., Newport, Ky.

**Gohi**—Sheets. Newport Rolling Mill Co., Newport, Ky.

**Golden Rod**—Air Conditioning Units, Fans and Wheels, Blowers. F. Jaden Mfg. Co., Inc., Hastings, Nebr.

**Gordon**—Gas Conversion Burners. Roberts-Gordon Appliance Corp., Buffalo.

**Gradutrol**—Controls. Minneapolis-Honeywell Regulator Co., Minneapolis.

**Graham**—Variable Speed Pulleys. Briggs & Stratton, Milwaukee.

**Grand Rapids**—Vacuum Furnace Cleaner. Doyle Vacuum Cleaner Co., Grand Rapids, Mich.

**Granodine**—Metal Protecting Paint. American Chemical Paint Co., Ambler, Pa.

**Graylite**—Building and Duct Insulation. Insulite Div. Minnesota and Ontario Paper Co., Minneapolis.

**Greastop**—Filters. Air-Maze Corporation, Cleveland.

**Grid**—Heating and Cooling Coils. D. J. Murray Mfg. Co., Wausau, Wis.

**Grillometer**—Direct Reading Air Velocity Meter. Detroit Air Conditioning Service Co., Inc., Detroit.

**Gross-Aire** — Furnaces and Stokers. Grossenbacher Furnace Co., St. Louis.

**Gurney** — Furnaces. East Anaheim Sheet Metal Works, Long Beach, Cal.

## H

**H-B**—Gas Conversion Burner. Handley Brown Heater Co., Jackson, Mich.

**H&C**—Registers. Hart & Cooley Mfg. Co., Holland, Mich.

**H & K**—Perforated Metals. Harrington & King Perforating Co., Chicago.

**HairBestos**—Insulation. Wilson & Co., Inc., Chicago, Ill.

**Haircraft**—Insulation. Wilson & Co., Inc., Chicago, Ill.

**Hall Cooler**—A. C. Units. Hall Manufacturing Co., Cedar Rapids, Ia.

**Hammerkraft**—Enamels and Lacquers. Hilo Varnish Corp., Brooklyn.

**Hammer-Sets**—Expansion Bolts. Rawlplug Co., Inc., New York City.

**Handnib**—Punches. National Machine Tool Co., Racine, Wis.



**Handy**—Pipe, Prefabricated Ducts and Fittings. F. Meyer & Bro. Co., Peoria, Ill.

**Handy-Andy**—Clinker Tong. Northwestern Stove Repair Co., Chicago, Ill.

**Handy Change**—Arc Welders. Maple Valley Mfg. Co., Mapleton, Iowa.

**Handy-Flux**—Soldering Flux. Handy & Harman, New York City.

**Happy Thought**—Heaters. Pittston Stove Co., Pittston, Pa.

**Hardinge-Zephyr**—Oil Burners. Hardinge Oil Burner Co., Chicago.

**Hardweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

**Health Air**—Blowers, Furnaces. Economy Baler Co., Ann Arbor, Mich.

**Health-Air**—Window Ventilator-Filters. Ad-Lee Co., Inc., Chicago.

**Health-aire**—A. C. Units, Blower, Colls, Fans, Louvers and Shutters and Ventilators. Johnson Fan & Blower Corp., Chicago, Ill.

**Heat-Aid**—Furnace Linings. Pyrolite Products Co., Cleveland, Ohio.

**Heat Booster**—Warm Air Booster Fans. Victor Electric Products, Inc., Cincinnati.

**Heat Breaker**—Fans. Esko Mfg. Corp., Houston, Tex.

**Heatcote**—Paint. Debevoise Co., Brooklyn, N. Y.

**Heat Check**—Insulating Cement. Refractory & Insulation Corp., New York City.

**Heatmaker**—Circulating Heater. Iron Fireman Mfg. Co., Cleveland.

**Heat-Pak**—Oil Burners. Aldrich Co., Wyoming, Ill.

**Heat Proof**—Paint. Glidden Co., Cleveland.

**Heat-Rite**—Gravity Registers. Auer Register Co., Cleveland.

**Heatwave**—Furnaces. Stephens Mfg. Co., Tulsa, Okla.

**Heatrola**—Heaters. Estate Stove Co., Hamilton, O.

**Heatseal**—Insulation. Ehret Magnesite Mfg. Co., Valley Forge, Pa.

**Heavyduty**—Damper Quadrants. Parker-Kalon Corp., New York City.

**Heat-Master**—Kettles. Aeroil Burner Co., Inc., West New York, N. J.

**Hellite**—Refractories. Johns-Manville, New York, N. Y.

**Hemetec**—Furnaces. Favorite Stove Co., Piqua, Ohio.

**Hercules**—Fan Roof Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.

**Hercules**—Furnaces. Johnston Gas Furnace Corp., North Hollywood, Cal.

**Hercules**—Gravity Roof Ventilators. Berger Bros. Co., Philadelphia.

**Heresite**—Pipe and Fittings. Heremetal Co., Minneapolis.

**Hero**—Heaters. J. V. Patten Co., Sycamore, Ill.

**Rev-H-Oil**—Oil Burners. Sanmyer Corp., Chicago.

**Hi-Boy**—Furnaces. Aladdin Heating Corp., Oakland, Cal.

**HiBoy**—Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.

**Hicycle**—Electric Tools. Chicago Pneumatic Tool Co., New York City.

**Highflex**—Belts. B. F. Goodrich Co., Akron, O.

**Highway**—Copper Iron. Apollo Steel Co., Apollo, Pa.

**Hi Heat**—Enamels and Lacquers. Aluminum Paint. J. H. Krehbiel Co., Chicago.

**Hi-Lo**—Variable Speed Pulleys. Equipment Engineering Co., Minneapolis.

**Hilo Spatter**—Enamels and Lacquers. Hilo Varnish Corp., Brooklyn.

**Hilume**—Aluminum Paint. Hilo Varnish Corp., Brooklyn.

**Hi-Speed**—Nibbler and Shears. Libert Machine Co., Green Bay, Wis.

**Hitoncast**—Grilles. Tuttle & Bailey, Inc., New Britain, Conn.

**Hoffman**—Oil Burners. Shedlov Oil Burners, Inc., Minneapolis, Minn.

**Hold Heat**—Soldering Coppers. Turner Brass Works, Sycamore, Ill.

**Hold-Heat**—Controls, Thermostats, Transformers. Russell Electric Co., Chicago, Ill.

**Holgun**—Portable Electric Drills. Black & Decker Mfg. Co., Towson, Md.

**Holtite**—Screws. Continental Screw Co., New Bedford, Mass.

**Home**—Furnaces. Rock Island Stove Co., Rock Island, Ill.

**Home Comfort**—Blowers, Furnaces. St. Louis Furnace Mfg. Co., St. Louis.

**Horneblende**—Metal Protecting Paint. North American Fibre Products Co., Cleveland.

**Hot Blast**—Soldering Furnaces and Torches. Turner Brass Works, Sycamore, Ill.

**Hotco**—Furnaces, Oil Burners. Hotentot Co., Inc., Omaha, Nebr.

**Hot Spot**—Electric Welders. Acme Electric Welder Co., Los Angeles.

**Hot Wave**—Colls. Rudy Furnace Co., Dowagiac, Mich.

**Howie**—Heat Savers. Condensation Engineering Corp., Chicago, Ill.

**Hoyt**—Lead Roofing. National Lead Co., New York, N. Y.

**Huber**—Overfeed Stokers. Flynn & Emrich Co., Baltimore, Md.

**Humidair**—Humidifiers. Skilbeck Mfg. Co., Kenosha, Wis.

**Humidair**—Washers. American Foundry & Furnace Co., Bloomington, Ill.

**Humidigrad**—Valves. Monmouth Products Co., Cleveland.

**Humidigrade**—Hygrometer. Taylor Instrument Companies, Rochester, N. Y.

**Humidostat**—Humidistats. Johnson Service Co., Milwaukee, Wis.

**Humitherm**—Air Conditioning Units. Grinnell Co., Inc., Providence, R. I.

**Humphrey**—Furnaces. General Gas Light Co., Kalamazoo, Mich.

**Hydraulic-Action**—Controls. White-Rodgers Electric Co., St. Louis.

**Hydro - Clone**—Blowpipe Collectors. Faraday Eng. Co., Boston.

**Hydronon**—Concrete Waterproofing Paint. Barrett Div., Allied Chemical & Die Corp., New York City.

**Hydro-Proof**—Water-Proofing Compounds. Asphalt Products Co., Syracuse, N. Y.

**Hydro-Whirl**—Dust Collectors. Industrial Sheet Metal Works, Inc., Detroit.

**Hy-Duty**—Bearings, Blades, Fans, Blowers, Housings, Pumps, Ventilators, Wheels. Schwitzer-Cummins Co., Indianapolis, Ind.

**Hy-Power**—Snips and Shears. Wiss & Sons Co., J., Newark, N. J.

**Hytemp**—Insulation. Keasbey & Mattison Company, Ambler, Pa.

**Hytect**—Paint. National Mfg. Co., Tonawanda, N. Y.

**IEC**—Relays, Switches. Industrial Engineering Corp., Terre Haute, Ind.

**Ice-O-Matic**—Compressors. Williams Oil-O-Matic Heating Corp., Bloomington, Ill.

**Ideal**—Furnace Brushes. Worcester Brush & Scraper Co., Worcester, Mass.

**Ideal**—Roofing Nails. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

**Ideal (Air Cell)**—Insulation. Hinde & Dauch Paper Co., Sandusky, Ohio.

**Ilgair**—Fans. Ilg Electric Ventilating Co., Chicago, Ill.

**Ilgette**—Kitchen Exhaust Fans. Ilg Electric Ventilating Co., Chicago.

**Impact**—Spray Nozzles. Phillips Cooling Tower Co., Inc., New York City.

**In-Bilt**—Kitchen Exhaust Fans. Victor Electric Products, Inc., Cincinnati.

**Inco**—Paint. Inter-Coastal Paint Co., East St. Louis, Ill.

**Inco**—Nickel Alloys and Welding Rod. International Nickel Co. Inc., New York City.

**Inconel**—Alloys. International Nickel Company, Inc., New York City.

**Independent**—Furnaces. Independence Stove & Furnace Co., Independence, Mo.

**Indian**—Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.

**Indian**—Oil Burners. Pioneer Manufacturing Co., Cedar Rapids, Ia.

**IngAclad**—Plates and Sheets. Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.

**Ingels**—Elbow Machines and Punches. Maplewood Machinery Co., Chicago.

**Ingle**—Oil Burners and Furnaces. National Iron Works, San Diego, Cal.

**Ingot Iron**—Sheets, Ridge Rolls and Ridging. American Rolling Mill Co., Middletown, Ohio.

**Inkstop**—Filters. Air-Maze Corporation, Cleveland.

**Insa-Lute**—Insulating Cement. Sauer-eisen Cements Co., Pittsburgh, Pa.

**Ins-Lite**—Building and Duct Insulation. Insulite Div. Minnesota and Ontario Paper Co., Minneapolis.

**Insulag**—Insulation and Insulating Cement. Quigley Co., Inc., New York City.

**Insulbiox**—Insulation. Quigley Co., Inc., New York City.

**Insulate-Windows**—Heat Insulating Windows. Chamberlin Metal Weather Strip Co., Inc., Detroit.

**Insulbrick**—Insulation. Quigley Co., Inc., New York City.

**Insulcrete**—Insulation. Quigley Co., Inc., New York City.

**Insulseal**—Caulking Compounds. Eagle-Picher Lead Co., Cincinnati.

**Ionaire**—Ozone Apparatus. Electroaire Corp., Chicago.

**Interlock**—Pipe. Milcor Steel Co., Milwaukee, Wis.

**Ironite**—Hot Surface Paint. Acorn Refining Co., Cleveland.

**Ironset**—Furnace Cement. Fireline Stove & Furnace Lining Co., Chicago, Ill.

**Ironsides**—Paint. Thompson & Co., Pittsburgh, Pa.

**Ironton**—Gas Burners, Heaters. Continental Stove Corp., Ironton, O.

**Ist City**—Registers. Rock Island Register Co., Rock Island, Ill.

**Iso-Tem**—Automatic Heat Control. Tem Products Co., Midland, Pa.

**Ivanhoe**—Heaters. Perfection Stove Co., Inc., Cleveland.

## J

**J-M**—Insulation, Roofing. Johns-Manville, New York, N. Y.

**J.M.C.**—Oil Burners. Johnson Mfg. Co., Waterloo, Iowa.

**Jack Frost**—Insulation. Barrett Div., Allied Chemical & Die Corp., New York City.

**Janitrol**—A. C. Units, Gas Burners, Furnaces. Surface Combustion Corp., Toledo.

**Jennings**—Pumps. Nash Engineering Co., South Norwalk, Conn.

**Jet-O-Matic**—Water Circulating Pumps. Gould Pumps Inc., Seneca Falls, N. Y.



**Jewel**—Furnaces, Heaters. Detroit-Michigan Stove Co., Detroit.  
**Jiffy**—Coils. Hotstream Heater Co., Cleveland, O.  
**Jiffy**—Regulator Set. Parker-Kalon Corp., New York City.  
**Jointite**—Insulation. Mundet Cork Corp., Brooklyn, N. Y.  
**Jumbo**—Oil Burners. The Aldrich Co., Wyoming, Ill.  
**June-Aire**—Furnaces. American Foundry & Furn. Co., Bloomington, Ill.  
**Junata**—Soldering Flux. Geo. W. Diener Mfg. Co., Chicago, Ill.  
**Junior-30**—Stokers. Scott-Newcomb, Inc., St. Louis.  
**JusRite**—Ducts and Furnace Pipe and Fittings. Corbman Bros., Inc., Philadelphia, Pa.

## K

**K-B**—Damper Clips, Tips and Regulator Sets. G. L. Kerentoff, Cincinnati.  
**KCB**—Sheets. Newport Rolling Mill Co. Newport, Ky.  
**KCB**—Eaves Trough and Gutters, Pipe, Ridge Rolls and Ridging, Roofing Globe Iron Roofing & Corrugating Co., Newport, Ky.  
**KO**—Oil Burning Water Heaters. Automatic Humidifier Co., Cedar Falls, Iowa.  
**K.S.V.**—Ventilators. Kernchen Co., Chicago, Ill.  
**Kant Krush**—Roof Strainers. Grand Rapids Wire Products Co., Grand Rapids, Mich.  
**Karatex**—Insulation. Blocksom & Company, Michigan City, Ind.  
**Kast-O-Lite**—Refractories. A. P. Green Fire Brick Co., Mexico, Mo.  
**Kathabar**—A. C. Units. Surface Combustion Corp., Toledo, O.  
**Kelsey-Bradley**—Furnaces. Kelsey Heating Co., Inc., Syracuse, N. Y.  
**Kemlok**—Paint. American Chemical Paint Co., Ambler, Pa.  
**Ken**—Flue Gas Analyzers, Controls, Humidifiers, Damper Motors, Thermometers and Valves. Barclay, Inc., Robert, Chicago.  
**Keystone**—Heaters. J. V. Patten Co., Sycamore, Ill.  
**Kimsul**—Insulation. Kimberly-Clark Corp., Chicago.  
**Kitchen-aire**—Fans. Allen Corp., Detroit.  
**Kleen Air**—Register Shields. Swing-A-Way Steel Products, Inc., Chicago.  
**Kleenso**—Filters. Air-Maze Corp., Cleveland.  
**Klixon**—Controls, Switches, Humidistats, Motors, Relays, Switches, Thermostats. Spencer Thermostat Co., Attleboro, Mass.  
**Klondike**—Welders. Ralph Fern, Scranton, Pa.  
**Knock-Out**—Arc Welders, Buffers, Grinders, Polishers and Sanders. K. O. Lee & Son Co., Aberdeen, S. D.  
**Kno-Draft**—High Velocity Air Diffusers. W. B. Connor Eng. Corp., Dorex Div., New York City.  
**Kold-Aire**—Air Conditioning Units. U. S. Air Conditioning Corp., Minneapolis.  
**Kolostat**—Furnace Draft Regulator. P. C. Timm & Son, Lincoln, Neb.  
**Koncal**—Ventilators. Milcor Steel Co., Milwaukee, Wis.  
**Kooler-Aire**—Air Conditioning Units. U. S. Air Conditioning Corp., Minneapolis.  
**Koolshade**—Sun Reflecting Screens. Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.  
**Koolstack**—Furnaces. Leader Iron Works, Decatur, Ill.  
**Koppax**—Paint. Koppers Co., Pittsburgh, Pa.

**Kor-Ner-Lok**—Pittsburgh Lock Forming Machine. Binkley Mfg. Co., Warrenton, Mo.  
**Kristokrak**—Enamels and Lacquers. Zapon-Brevolite Division Atlas Powder Co., North Chicago, Ill.  
**Kuehn's**—Gutters. Milcor Steel Co., Milwaukee.  
**Kumfort Cooler**—Evaporative Coolers. Utility Fan Corporation, Los Angeles.  
**Kwik-Way**—Ladder Brackets. Myers Ladder Equipment Co., Madison, Wis.

## L

**L. A.**—Motors. Louis Allis Co., Milwaukee, Wis.  
**L & M**—Instruments. Leads & Northrup Co., Philadelphia, Pa.  
**LP**—Ducts, Fittings, Grilles, Pipe, Registers and Ventilators. Lamneck Products, Inc., Middletown, Ohio.  
**L & B**—Conductor Pipe. Lamb & Ritchie Co., Cambridge, Mass.  
**L-E**—Flexible Couplings. Lovejoy Flexible Coupling Co., Chicago, Ill.  
**L-U**—Gravity Roof Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.  
**Lacq**—Lacquers. Glidden Company, Cleveland.  
**Lakeside**—Blowers. Furblo Co., Hermansville, Mich.  
**Lancol**—Stainless Steel Soldering Flux. F. H. Langsenkamp Co., Indianapolis, Ind.  
**Lapidolith**—Concrete Waterproofing Paint. L. Sonneborn Sons, Inc., New York City.  
**Lastik Wampum**—Cement Paint. Lastik Products Co., Inc., Pittsburgh.  
**Lawson**—Heaters. Continental Stove Corp., Ironton, O.  
**Leader**—Oil Burners. Pressure Oil Burners, Inc., York, Pa.  
**Leader**—Oil Burners and Circulating Heaters. Victor Oil Burner Mfg. Co., Hartford, Conn.  
**Lead-Head**—Nails. W. H. Maze Co., Peru, Ill.  
**Lead-Seal**—Roofing Nails. The Deniston Co., Chicago.  
**Lectro-Shear**—Portable Electric Shears. Black & Decker Mfg. Co., Towson, Md. and Van Dorn Electric Tool Co., The, Towson, Md.  
**Lehigh**—Furnaces, Heaters. Pittston Stove Co., Pittston, Pa.  
**Leonard**—Circulating Oil Heater. W. R. Ames Co., San Francisco.  
**LeBoy**—Fan and Gravity Roof Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.  
**Liberty**—Paint. Carter Paint Co., Liberty, Ind.  
**Liberty**—Ventilators. Penn Ventilating Company, Philadelphia.  
**Lifetime**—Furnaces. Hart & Crouse Corp., Utica, N. Y.  
**Lifetime**—Furnace Pipe Fittings & Accessories. Campbell Heating Co., Des Moines, Ia.  
**Lightweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.  
**Lincoln**—Furnaces and Heaters. American Foundry & Furnace Co., Bloomington, Ill.  
**Line-Weld**—Motors. Lincoln Electric Co., Cleveland, O.  
**Lindsay Structure**—Cabinets and Casings and Housing Assemblies. Dry-Zero Corporation, Chicago.  
**Linseal**—Furnace Cement. Buckeye Products Co., Cincinnati.  
**Linestart**—Motors. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.  
**Lipman**—Coils, Compressors. General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.

**Liquid Elastigum**—Paint and Roofing Cement. Barrett Div., Allied Chemical & Die Corp., New York City.  
**Lithoform**—Metal Protecting Paint. American Chemical Paint Co., Ambler, Pa.  
**Little Blacksmith**—Punches and Slitting Machines. J. F. Kidder Mfg. Co., Inc., Burlington, Vt.  
**Little Giant**—Time Switches. Tork Clock Co., Inc., Mt. Vernon, N. Y.  
**Llenroc**—Fire Doors. Cornell Iron Works, Inc., Long Island City, N. Y.  
**Lloyd's**—Stainless Soldering Flux. Lloyd S. Johnson Co., Chicago.  
**Lo-Blast**—Gas Conversion Burners. National Machine Works, Chicago, Ill.  
**Lo-Boy**—Stokers. Whiting Corp., Harvey, Ill.  
**Lockaire**—Insulation Board. Plastergon Wall Board Co., Buffalo.  
**Lock-Joint**—Pipe and Pipe Fittings and Accessories. Milcor Steel Co., Milwaukee.  
**LoMaintenance**—Electric Motors. Allis-Chalmers Mfg. Co., Milwaukee, Wis.  
**Lornate**—Chimney Caps & Tops, Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.  
**LongLife**—Furnaces. Henry Furnace & Fdy. Co., Cleveland.  
**Lowdensite**—Insulation. Insulite Div. Minnesota and Ontario Paper Co., Minneapolis.  
**Luco**—Acid Brushes, Compounds, Flux, Solder. Thos. F. Lukens Metal Co., Philadelphia, Pa.  
**Ludlite**—Stainless Steel, Roofing and Sheets. Allegheny Ludlum Steel Corp., Pittsburgh.  
**Lumino**—Paint. Koppers Co., Pittsburgh, Pa.  
**Lumitall**—Aluminum Paint. National Mfg. Co., Tonawanda, N. Y.  
**Luxaire**—Blower-Filters, Furnaces and Humidifiers. The C. A. Olsen Manufacturing Co., Elyria, O.  
**Lyonore**—Sheets. Lyon-Conklin & Co., Inc., Baltimore.

## M

**M & E**—Compressors, Solder. Merchant & Evans Co., Philadelphia, Pa.  
**M.F.C.**—Gas Floor Furnaces. Moncrief Furnace & Mfg. Co., Inc., Dallas, Tex.  
**M-H**—Controls. Minneapolis-Honeywell Regulator Co., Minneapolis.  
**M & H**—Zinc Sheets. Matthiessen & Hegeler Zinc Co., LaSalle, Ill.  
**M & M**—Humidifiers and Fittings, Nozzles, Switches and Valves. McDonnell & Miller, Chicago, Ill.  
**M & S**—Cork Insulation. Mitchell & Smith, Inc., Detroit.  
**M-VB**—Humidifier, Fittings, Valves. Scovill Mfg. Co., Morency-Van Buren Div., Sturgis, Mich.  
**M/W**—Filters. American Air Filter Co., Inc., Louisville, Ky.  
**Macheta**—Fans and Fan Blades. Aerovent Fan Co., Piqua, O.  
**Mack**—Heaters. J. V. Patten Co., Sycamore, Ill.  
**Magic Dial**—Thermostats. Perfex Corporation, Milwaukee.  
**Magic Weather**—Air Conditioners, Blowers and Air Washers. Ballantyne Co., Omaha.  
**Majestic**—Roofing, Skylights, Ventilators. W. A. Fingles, Inc., Baltimore.  
**Manganweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.  
**Mark Time**—Time Switches. M. H. Rhodes, Inc., Hartford, Conn.  
**Marlox**—Metal Protecting Paints. Marley Chemical Co., Detroit.  
**Mars**—Furnaces. Pacific Gas Heating Co., San Francisco.

**Marvel**—Punches. Armstrong-Blum Mfg. Co., Chicago, Ill.

**Mascoll**—Insulation. Munn and Steele, Inc., Newark, N. J.

**Massachusetts**—Blowers, Fans. Bishop & Babcock Mfg. Co., Cleveland, O.

**Master**—Controls, Pulleys, Thermostats. White Mfg. Co., St. Paul, Minn.

**Master**—Air Conditioning Furnaces. Premier Furnace Co., Dowagiac, Mich.

**Master**—Hangers and Fittings. Royal-Apex Mfg. Corp., Brooklyn, N. Y.

**Master**—Stokers. Muncie Gear Works, Inc., Muncie, Ind.

**Master Blower**—Thermostatic Hydraulic Control. White Mfg. Co., Minneapolis.

**Master Kraft**—Air Conditioning Units, Furnaces, Coils, Oil Burners, Regulators and Heat Savers. Harvey-Whipple, Inc., Springfield, Mass.

**Master Line**—Soldering Torches. Turner Brass Works, Sycamore, Ill.

**Mastr-Lok**—Pipe Fittings. Parkersburg Iron & Steel Co., Parkersburg, W. Va.

**Max-i-min**—Furnaces. The Gehrl Co., Tacoma, Wash.

**Mayari B**—Nickel-Chromium Sheets and Plates. Bethlehem Steel Co., Bethlehem Pa.

**Mayn Air**—Stack Head Damper. Controlair, Inc., Elyria, Ohio.

**McIlvaine**—Oil Burners. Landwehr Heating Corp., Philadelphia, Pa.

**Meco**—Gas Welding Rod, Torches. Modern Engineering Co., St. Louis.

**Meco Jiffy**—Soldering Torches. Modern Engineering Co., St. Louis.

**Mel-Rock**—Ventilators and Washers. Mellish & Murray Co., Chicago.

**Metalbestos**—Pipe and Fittings. Williams-Wallace Co., San Francisco.

**Metal-Coat**—Copper Paint. J. W. Stokes, Jr., Brooklyn.

**Metallite**—Paint. Glidden Company, Cleveland.

**Metal-Master**—Snips and Shears. J. Wiss & Sons Co., Newark, N. J.

**Metaphram**—Draft Regulator. Minneapolis-Honeywell Regulator Co., Minneapolis.

**Metrotherm**—Thermostats. General Controls Co., Glendale, Cal.

**Meyco**—Furnaces. Meyer Furnace Co., Peoria, Ill.

**Micro-Feed**—Monmouth Products Co., Cleveland.

**Microstat**—Thermostats. Julien P. Friez & Sons, Baltimore.

**Microtrol**—Damper Motors. Barber-Colman Co., Rockford, Ill.

**Microtherm**—Thermostats. Barber-Colman Co., Rockford, Ill.

**Micro-Weld**—Spot Welders. Micro Products Co., Chicago.

**Midget**—Bending Brake. A. R. Harris, Hammond, Ind.

**Midget**—Valves. Maid-O'-Mist, Inc., Chicago.

**Midget Kooler-air**—Air Conditioning Units. U. S. Air Conditioning Corp., Minneapolis.

**Mighty Midget**—Furnaces. Dowagiac Steel Furnace Company, Dowagiac, Mich.

**Mighty Midget**—Furnaces. Floral City Company, Monroe, Mich.

**Mighty Midget Unishear**—Shears. Stanley Works, New Britain, Conn.

**Mildaire**—Furnaces. Parker Heating & Mfg. Co., St. Petersburg, Fla.

**Miles**—Blowers. Henry Furnace & Foundry Co., Cleveland.

**Miles, Jr.**—Propeller Furnace Fans. Henry Furnace & Foundry Co., Cleveland, O.

**Milwaukee**—Ventilators. Milcor Steel Co., Milwaukee, Wis.

**Minnemeyer**—Fittings. LaCrosse Steel Roofing & Corrugating Co., LaCrosse, Wis.

**Minute**—Damper Regulator Sets. Joal Mfg. Corp., Toledo.

**Minute Man**—Oil-fired Conditioner. Conco Corporation, Mendota, Ill.

**Miracle-Air**—Window Ventilators. Ad-Lee Co., Inc., Chicago.

**Mistoll**—Oil Burners. Wayne Oil Burner Corp., Fort Wayne, Ind.

**Mistolator**—Oil Burners, Automatic Burner Corp., Chicago, Ill.

**Mobilair**—Room Air Conditioning Unit. Westinghouse Electric & Mfg. Co., East Springfield, Mass.

**Model**—Furnaces, Heaters. Home Stove Co., Indianapolis, Ind.

**Moderator**—Air Conditioning Units. Clarage Fan Co. Kalamazoo, Mich.

**Modernair**—Blower-Filter Units. Payne Furnace & Supply Co., Beverly Hills, Cal.

**Modernaire**—Heaters. Globe Machine & Stamping Co., Cleveland.

**Modernaire**—Air Conditioning Units. Dallas Eng. Co., Inc., Dallas, Tex.

**Moderne-Aire**—Furnaces, Blowers. Agricola Furnace Co., Gadsden, Ala.

**Modern Console**—Heaters. Payne Furnace & Supply Co., Inc., Beverly Hills, Cal.

**Moderne**—Blowers, Furnaces. Agricola Furnace Co., Inc., Gadsden, Ala.

**Modernistio**—Heaters. Agricola Furnace Co., Inc., Gadsden, Ala.

**Moditherm**—Air Conditioning Units. Clarage Fan Co., Kalamazoo, Mich.

**Modutrol**—Damper Duct Motors and Fan Controls. Minneapolis-Honeywell Regulator Co., Minneapolis.

**Mogul**—Rust Preventive Chemicals. North American Fibre Products Co., Cleveland.

**Molstair**—Furnaces. Round Oak Co., Dowagiac, Mich.

**Moldit**—Refractories. Refractory & Insulation Corp., New York City.

**Moler**—Insulation. F. L. Smidth & Co., New York City.

**Monarch**—Furnaces. Forest City Foundries Co., Cleveland.

**Moncrief**—Blower-Filters, Prefabricated Ducts, Pipe Fittings and Accessories, Furnaces, Heaters, Humidifiers. Henry Furnace & Foundry Co., Cleveland, O.

**Monel**—Sheets. International Nickel Co., Inc., New York City.

**Monite**—Humidifier Plates. Monmouth Products Co., Cleveland.

**Monitor**—Furnaces. Marshall Furnace Co., Marshall, Mich.

**Monogram**—Furnaces. Quincy Stove Mfg. Co., Quincy, Ill.

**Monovent**—Ridge Ventilators. Burt Mfg. Co., Akron, Ohio.

**Mor-Mac**—Furnaces. Morrison Steel Products, Inc., Buffalo.

**Morning Air**—Furnaces. Jackson Sheet Metal Wks., Ogden, Utah.

**Moto-Heat**—Oil Burners. Brigham Oil Burner Co., St. Louis, Mo.

**Motopump**—Water Circulating Pumps. Yeomans Bros. Co., Chicago.

**Mototurb**—Ventilators. Uno Ventilator Co., Cliftondale, Mass.

**Mule-Hide**—Caulking Compounds, Paint and Roofing. Lehon Company, Chicago.

**Multiclone**—Collectors. Research Corp., New York, N. Y.

**Multi-Panel**—Filters. American Air Filter Co., Inc., Louisville, Ky.

**Multitherm**—Air Conditioning Units. Clarage Fan Co., Kalamazoo, Mich.

**Multi-V-Type**—Filters. Staynew Filter Corp., Rochester, N. Y.

**Multivane**—Blowers. B. F. Sturtevant Co., Hyde Park, Boston.

**Multi-Zone**—Conditioners. Michell Air Conditioning Co., Inc., Schenectady, N. Y.

**Murex**—Arc Welding Electrodes. Metal & Thermit Corp., New York City.

## N

**Nairoil**—Oil Burners. National Airoil Burner Co., Philadelphia, Pa.

**National**—Blowers, Furnaces. P. H. Ma-Girl Foundry & Furnace Wks., Bloomington, Ill.

**National**—Furnaces, Heaters. Excelsior Stove & Mfg. Co., Quincy, Ill.

**National**—Registers. United States Register Co., Battle Creek, Mich.

**Natroco**—Paint. National Mfg. Corp., Tonawanda, N. Y.

**Nelson**—Stokers. Heating Assurance, Spokane, Wash.

**Nesbit**—Furnaces. Standard Furnace & Supply Co., Omaha, Nebr.

**Nev-A-Rust**—Protective Metal Coatings. Glidden Company, Cleveland.

**Never Slip**—Conductor Fittings. LaCrosse Steel Roofing & Corrugating Co., LaCrosse, Wis.

**New American**—Smoke Pipe Dampers. Griswold Mfg. Co., Erie, Pa.

**New Departure**—Aldrich Company, Wyoming, Ill.

**Newmanco**—Kalamein Doors, Grilles, Registers. Newman Brothers, Inc., Cincinnati, O.

**Newton**—Mallets. Warren Handle Works Co., Cortland, Ohio.

**Niagara**—Furnaces. Forest City Foundries Co., Cleveland, O.

**Nickelchromeweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland.

**Niteair**—Night Air Cooling Fans. Lau Blower Co., Dayton, Ohio.

**Nitrol**—Spray Nozzles. Hubbard Company, Minneapolis.

**Noel**—Arc Welders. The Ideal Electric & Mfg. Co., Mansfield, O.

**No-Flex**—Registers and Faces. Hart & Cooley Mfg. Co., Holland, Mich.

**Nokorode**—Flux. Chase Brass & Copper Co., Incorporated, Waterbury, Conn.

**Non-Clogging**—Spray Nozzles. Link Belt Co., Chicago.

**Non-Con-Dux**—Cement, Insulation, Paper, Paste. Grant Wilson, Inc., Chicago, Ill.

**Nonolze**—Blowers. American Foundry & Furnace Co., Bloomington, Ill.

**Non-Syphoning**—Steel Roofing. Milcor Steel Co., Milwaukee.

**Norblo**—Blowers, Collectors, and Air Washers. Northern Blower Co., Cleveland, Ohio.

**Norco**—Products. Northwestern Stove Repair Co., Chicago.

**Norfolk**—Blower-Filters, Furnaces, Heaters, Humidifiers. Sioux City Foundry and Boiler Co., Sioux City.

**Northland**—Heaters. J. V. Patten Co., Sycamore, Ill.

**North Wind**—Window Fans. American Metal Products Co., Fort Worth, Tex.

**Norwester**—Blowers. Grand Rapids Die & Tool Co., Grand Rapids, Mich.

**Norwol**—Insulation. Norristown Magnesia & Asbestos Co., Norristown, Pa.

**No-Sag**—Register Shields. Pentecost & Craft Co., Terre Haute, Ind.

**No-Streak**—Registers. Rock Island Register Co., Rock Island, Ill.

**No. 2000**—Insulating Cement. J. H. Krehbiel Co., Chicago.

**No-Ve-U**—Door Ventilators. Waterloo Register Co., Waterloo, Iowa.

**Novoid**—Aluminum Paint. Bases, Insulation. Cork Import Corp., New York, N. Y.



**Nu-Air**—Air Conditioning Units. American Metal Products, Fort Worth, Tex.

**Nu-Air**—Blades and Fans. Meier Electric & Machine Co., Indianapolis, Ind.

**Nu-Air**—Ventilators. Milcor Steel Co., Milwaukee, Wis.

**Nu-Alpina**—Gravity Roof Ventilators. Milcor Steel Co., Milwaukee, Wis.

**Nubrite**—Aluminum Paint. Acorn Refining Co., Cleveland.

**Nu-Dry**—Furnace Cement. Pyrolite Products Co., Cleveland, O.

**Nu-Grip**—Snips and Shears. J. Wiss & Sons Co., Newark, N. J.

**Nu-Notch**—Ventilators. Knowles Mushroom Ventilator Co., Montclair, N. J.

**Nuroof**—Roof Cement. Acorn Refining Co., Cleveland.

**Nussbaum**—Furnaces. American Standard Gas Products Co., Detroit.

**Nusurface**—Hot Surface Paint. Acorn Refining Co., Cleveland.

**Nutipe**—Gas Conversion Burners. Columbia Burner Company, Toledo.

**Nu-Way**—Sheet Metal Products. Beatrice Steel Tank Mfg. Co., Beatrice, Nebr.

**Nu-Wood**—Rigid Insulation. Wood Conversion Co., St. Paul.

## O

**O-B Bulldog**—Expansion Bolts. Ohio Brass Co., Mansfield, Ohio.

**OK**—Conductor Pipe Strainers. U. S. Cistern Filter Mfg. Co., Bloomington, Ill.

**O. P.**—Stokers and Stoker-fired Furnaces. Pocahontas Fuel Company Incorporated, Cleveland.

**"Odorsorber"**—Odor Adsorbers. Dorex Div., W. B. Connor Eng. Corp., New York City.

**Ohio Lock**—Furnace Pipe. Reeves Steel & Mfg. Co., Dover, Ohio.

**Oil Chief**—Furnaces. Dowagiac Steel Furnace Company, Dowagiac, Mich.

**Oil-Economy**—Oil-Burning Air-Conditioning Furnace. International Heater Co., Utica, N. Y.

**Oil "Fire"**—Furnaces. McPherson Furnace & Supply Co., Portland, Ore.

**Oilfire Monogram**—Furnaces. Quincy Stove Mfg. Co., Quincy, Ill.

**Oilfyre**—Furnaces. Lennox Furnace Co., Marshalltown, Iowa.

**Oil Master**—Furnaces. Round Oak Co., Dowagiac, Mich.

**Oil Miser**—Furnaces. Floral City Company, Monroe, Mich.

**Oil-n-Aire**—Oil Burners. Aldrich Co., Wyoming, Ill.

**Oil-O-Matic**—Oil Burners. Williams Oil-O-Matic Heating Corp., Bloomington, Ill.

**Olympic**—Furnaces. Washington Stove Works, Everett, Wash.

**Olympic Bronze**—Bolts, Electrodes, Plates, Sheets. Chase Brass & Copper Co., Incorporated, Waterbury, Conn.

**Orsatomat**—Flue Gas Analyzer. Hays Corp., Michigan City, Ind.

**Oshkosh**—Stokers. Leach Co., Oshkosh, Wis.

**OutOWall**—Registers. Rock Island Register Co., Rock Island, Ill.

**Ovaltube**—Gas Burners. Beck Engineering Combustion Kompany, St. Louis.

**Orweld**—Welding Apparatus. Linde Air Products Co., New York, N. Y.

**Oxite**—Insulation. American Hair & Felt Co., Chicago.

## P

**PBA Unit**—Utility Room Furnace. Dowagiac Steel Furnace Co., Dowagiac, Mich.

**P-G-R**—Air Conditioning Units, Blower-Filters, Blowers, Pipe Fittings and Accessories, Registers and Valves. Pacific Gas Radiator Co., Huntington Park, Cal.

**P & H**—Arc Welding Electrodes. Harnischfeger Corporation, Milwaukee.

**P. & H. Hansen**—Arc Welders. Harnischfeger Corp., Milwaukee, Wis.

**P & R**—Air Conditioning Units, Furnaces and Pumps. Pernot & Rich, Inc., Los Angeles.

**Pacifelt**—Insulation. Pacific States Felt & Mfg. Co., Inc., San Francisco.

**Pacific**—Furnaces. W. W. Rosebraugh Co., Salem, Ore.

**Pacific Breeze**—Fans. Pryne & Co., Inc., Los Angeles, Cal.

**Pacific Everlast**—Furnaces. Pacific Gas Radiator Co., Huntington Park, Cal.

**Pacific Thermolator**—Circulating Heaters. Pacific Gas Radiator Co., Huntington Park, Cal.

**Packaged Weather**—Store Coolers. General Electric Co., Bloomfield, N. J.

**Paintgrip**—Sheets. American Rolling Mill Co., Middletown, Ohio.

**Palco Wool—Saferized**—Insulation. Pacific Lumber Co., San Francisco, Cal.

**Panama**—Registers. United States Register Co., Battle Creek, Mich.

**Paramount**—Flashing. Flemm Lead Company, Inc., Long Island City, N. Y.

**Paramount**—Flashings. Rochester Lead Works, Inc., Rochester, N. Y.

**Paramount**—Hollow Metal Windows. Willis Mfg. Co., Galesburg, Ill.

**Parasol**—Spray Nozzles. Spraying Systems Co., Chicago.

**Parco**—Skylight Lifts. Park City Cornice Works, Inc., Bridgeport, Conn.

**Par-Exc**—Oil Furnaces. Interstate Metal Products Co., Inc., Chicago.

**Parkspray**—Humidistats and Hygrometers. Parks-Cramer Co., Fitchburg, Mass.

**Patterson**—Roofing Clips. American Sheet Metal Works, New Orleans.

**Payneheat**—Heating Units. Payne Furnace & Supply Co., Beverly Hills, Cal.

**Pebble**—Grilles. American Foundry & Furnace Co., Bloomington, Ill.

**Pebble**—Registers. Auer Register Co., Cleveland, O.

**Peerless**—Blowers, Collectors, Washers. New York Blower Co., Chicago, Ill.

**Peerless**—Eaves Trough Hangers. Abbott Mfg. Co., Painesville, O.

**Penfex**—Metal Hose. Pennsylvania Flexible Metallic Tubing Co., Philadelphia.

**Penn-Aire**—Furnaces. Union Mfg. Co., Boyertown, Pa.

**Penn-Built**—Controls. Penn Electric Switch Co., Goshen, Ind.

**Penngun**—Water Heaters. Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.

**Penn-Mont**—Slate. Structural Slate Co., Pen Argyl, Pa.

**Pennrol**—Controls. Penn Electric Switch Co., Goshen, Ind.

**Pentco**—Combination Snip. Penn Tool Company, Philadelphia.

**Perfect-Fit**—Metal Ceilings. Milcor Steel Co., Milwaukee, Wis.

**Perfection**—Eaves Trough Fittings and Accessories. Iwan Brothers, South Bend, Ind.

**Perfection**—Mineral Wool Insulation. Riverton Lime & Stone Co., Inc., Riverton, Va.

**Perfect-Lap Two-Drain**—Steel Roofing. Milcor Steel Co., Milwaukee.

**Permat**—Filters. Davies Air Filter Corp., New York City.

**Perry**—Damper Clips and Tips. Griswold Mfg. Co., Erie, Pa.

**Pet**—Oil Burners. Aldrich Co., Wyoming, Ill.

**Petro**—Oil Burners. Petroleum Heat & Power Co., Stamford, Conn.

**Pexto**—Metal Workers' Machines and Tools. Peck, Stow & Wilcox Co., Southington, Conn.

**Philco-York**—Unit Air Conditioners. Philco, Philadelphia.

**Pilot**—Fans and Blowers. F. A. Smith Mfg. Co., Inc., Rochester, N. Y.

**Pioneer**—Oil Burners. Scott-Newcomb, Inc., St. Louis, Mo.

**Pitch-On-Metal**—Flashing. Cheney Company, Ardmore, Pa.

**Planoweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland.

**Plaster Bond**—Compounds. Barrett Div., Allied Chemical & Die Corp., New York City.

**Plastic-Calk**—Caulking Compounds. Chamberlin Metal Weather Strip Co., Inc., Detroit.

**Plastic Elastigum**—Cement. Barrett Div., Allied Chemical & Die Corp., New York City.

**Plastic PB**—Cement. Barrett Div., Allied Chemical & Die Corp., New York City.

**Plastiklast**—Roof Cement and Waterproofing Compound. Acorn Refining Co., Cleveland.

**Plastite**—Caulking Compounds. U. S. Stoneware Co., Akron, Ohio.

**Plastoid**—Compounds, Furnace Cement. Plastic Products Co., Detroit, Mich.

**Pleasant Home**—Furnaces. Peerless Foundry Co., Inc., Indianapolis, Ind.

**Flexiform**—Blowers. Bayley Blower Co., Milwaukee, Wis.

**Plavane**—Grilles and Registers. Tuttle & Bailey, Inc., New Britain, Conn.

**Plicast**—Hearth Cement Refractories. Plibrico Jointless Firebrick Co., Chicago, Ill.

**Plicast L-W-I**—Insulating Refractory. Plibrico Jointless Firebrick Co., Chicago.

**Plinamel**—Waterproofing Paint. Glidden Company, Cleveland.

**Pluramelt**—Stainless Clad Sheets. Allegheny Ludlum Steel Corp., Pittsburgh.

**Plymco**—Air Filters. Anderson Products, Inc., Cambridge, Mass.

**Plymco**—Air Filters. Plymouth Cordage Co., North Plymouth, Mass.

**Polair**—Air Conditioning Units. Pernot and Rich, Inc., Los Angeles.

**Polar Giant**—Air Conditioning Units. Giant Manufacturing Co., Council Bluffs, Iowa.

**Porcelite**—Tile. Columbian Enameling & Stamping Co., Inc., Terre Haute, Ind.

**Portage**—Furnaces. XXth Century Heating & Ventilating Co., Akron, O.

**Positive Arc**—Arc Welders. Welding Apparatus Co., Chicago, Ill.

**"Power-Flex"**—Stokers. Link Belt Co., Chicago.

**Powerstat**—Valves. Mercoid Corp., Chicago.

**Precipitron**—Automatic Air Filter. Westinghouse Electric & Manufacturing Co., Cleveland.

**Premier**—Furnace Vacuum Cleaner. Electric Vacuum Cleaner Co., Inc., Cleveland, O.

**Premier**—Circulating Heaters. Kleen-Heat, Inc., Chicago.



**Premier**—Sheets. Reeves Steel & Mfg. Co., Dover, Ohio.

**Premier Automatic**—Stoker-Fired Air Conditioning Furnaces. Premier Furnace Co., Dowagiac, Mich.

**Premier DeLuxe**—Furnaces. Premier Furnace Co., Dowagiac, Mich.

**Premier Master**—Furnaces. Premier Furnace Co., Dowagiac, Mich.

**Pre-Notch**—Ducts, Pipe and Fittings. Gray Metal Products, Inc., Rochester, N. Y.

**Presstico**—Furnace and Roof Cement, Compounds, Paint. Presstite Engineering Co., St. Louis.

**Presteel**—Metal Stampings. Worcester Pressed Steel Co., Worcester, Mass.

**Presteel**—Fan Housings. Commercial Shearing & Stamping Co., Youngstown, Ohio.

**Prest-O-Lite**—Soldering Coppers, Soldering Torches, Welding Equipment. Linde Air Products Co., New York, N. Y.

**Prest-O-Weld**—Oxy-Acetylene Welding Equipment, Torches. Linde Air Products Co., New York, N. Y.

**Princo**—Hygrometers, Psychrometers, Electric Relays, Thermometers and Thermostats. Precision Thermometer and Instrument Co., Philadelphia.

**Protection**—Soldering Furnaces and Torches. Clayton & Lambert Mfg. Co., Detroit, Mich.

**Protectolite**—Thermostats. Sampsel Time Control, Inc., Spring Valley, Ill.

**Protectomotor**—Filters. Staynew Filter Corp., Rochester, N. Y.

**Protector**—Snow Guards. David Levow, New York City.

**Protectorelay**—Electric Relays. Minneapolis-Honeywell Regulator Co., Minneapolis.

**Protectovent**—Window Ventilator and Filter Units. Staynew Filter Corp., Rochester, N. Y.

**Protex**—Protective Coating for Metal. Haydn F. White & Co., Cleveland.

**Pul-Air**—Ventilators. Penn Ventilating Co., Philadelphia.

**Pulverson**—Stokers. American Coal Burner Co., Chicago, Ill.

**Punchawl**—Tools. Hub Specialty Co., Somerville, Mass.

**Punkah**—Louvers. Kelvin-White Co., Boston.

**Purox**—Oxy-Acetylene Welding Equipment and Torches. Linde Air Products Co., New York, N. Y.

**Pyralux**—Enamels and Lacquers. E. I. du Pont de Nemours & Co., Wilmington, Del.

**Pyrobar**—Roofing Tile. United States Gypsum Co., Chicago.

## Q

**Q-Deck**—Roofing. H. H. Robertson Co., Pittsburgh.

**Q-T Ductliner**—Celotex Corp., Chicago.

**Quaker Burnoil**—Oil Burners, Furnaces and Heaters. Quaker Mfg. Co., Chicago.

**Quaker City**—Eaves Trough and Gutters, Conductor Fittings and Accessories, Pipe, Ridge Rolls and Ridging. Berger Brothers Company, Philadelphia.

**Queen City**—Shears. Niagara Machine & Tool Works, Buffalo, N. Y.

**Quick Cleaner**—Furnace Brushes. Pilley Brush Co., Fort Madison, Ia.

**Quick Heat**—A. C. Furnace. American Stove Co., Lorain, O.

**Quick-Set**—Dividers. Refner & Campbell, Inc., Elizabeth, N. J.

**Quiet-Air**—Furnace Blowers. Maple City Stamping Co., Peoria, Ill.

**Quiet May**—Air Conditioning Furnaces, Units, Oil Burners. May Oil Burner Corp., Baltimore, Md.

**"Quilt"**—Insulation. Samuel Cabot, Inc., Boston.

## R

**R & G**—Grilles, Registers. Register & Grille Mfg. Co., Inc., Brooklyn.

**RB**—Flexible Couplings. Link Belt Co., Chicago.

**R & I**—Furnace Cement. Refractory & Insulation Corp., New York City.

**R & I—Nuti**—Combustion Chambers. Refractory & Insulation Corp., New York City.

**R & M**—Motors. Robbins & Myers, Inc., Springfield, O.

**R.M.C.**—Burners. Rotary Mfg. Co., Los Angeles, Cal.

**RFM**—Flashing and Roofing Steel. H. H. Robertson Co., Pittsburgh.

**R-E-M**—Hygrometers, Psychrometers. The Palmer Co., Cincinnati.

**R-U-F**—Fans and Ventilators. Reed Unit-Fans, Inc., New Orleans, La.

**Race**—Air Conditioning Units and Gas Furnaces. Royal Air Conditioning Equipment, Alhambra, Cal.

**Racine**—Time Switches. Reliance Automatic Lighting Co., Racine, Wis.

**Radi-Ion**—Ozone Apparatus. Montgomery Brothers, San Francisco.

**Radolite**—Insulating Cement and Refractories. Pyrolite Products Co., Cleveland, Ohio.

**Radiant Heat**—Baffles. Jones Products Company, Ferndale, Mich.

**Rainbow Mist**—Nozzles. Peterson "Freezem" Mfg. Co., Kansas City, Mo.

**RainSeal**—Roofing. Reeves Steel & Mfg. Co., Dover, Ohio.

**Raintite**—Roof Ventilators. Aeolus Dickinson, Chicago.

**Ralpo**—Sheet Metal Cutters. Ralph W. Poe, Canton, Ill.

**Ramco**—Chimney Caps and Tops. Royal Apex Mfg. Corp., Brooklyn.

**Rapid Fire**—Furnaces and Heaters. Reynolds Mfg. Co., Springfield, Mo.

**Rator**—Venetian Blinds. Hough Shade Corp., Janesville, Wis.

**Rawl-Drive**—Masonry Nails and Expansion Bolts. Rawlplug Co., Inc., New York City.

**Rawls**—Expansion Bolts. Rawlplug Co., Inc., New York City.

**Readyweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland.

**Reco**—Fans and Motors. Reynolds Electric Co., Chicago.

**Recoy**—Air Conditioning Units and Coils. Refrigeration Economics Co., Inc., Canton, O.

**Red Band**—Motors. Howell Electric Motors Co., Howell, Mich.

**Red Devil**—Furnace Cement. Pecora Paint Co., Philadelphia.

**Redi**—Stokers. General Machinery Co., Spokane, Wash.

**Redi-Nail**—Eaves Trough Hangers. Abbott Mfg. Co., Painesville, O.

**Red Metallic**—Roofing Paint. Clinton Metallic Paint Co., Clinton, N. Y.

**Redox**—Paint. Thompson & Co., Pittsburgh, Pa.

**Red-Reading-Mercury**—Hygrometers, Psychrometers, and Thermometers. The Palmer Co., Cincinnati.

**Red Spindle**—Dampers. Stover Mfg. & Engine Co., Freeport, Ill.

**Red Top**—Insulation. United States Gypsum Co., Chicago, Ill.

**Red Top**—Thermostats. H-B Instrument Company, Philadelphia, Pa.

**Reflect-O-Cell**—Insulation. Aluminum Aircell Insulation Co., Detroit.

**Rego**—Brazing Torches. National Cylinder Gas Co., Chicago.

**Reillaloy**—Stove and Furnace Repairs. Pittsburgh Furnace Parts Co., Pittsburgh, Pa.

**Renarex**—CO<sub>2</sub> Analysers. Permutit Co., New York City.

**Renu**—Filters. American Air Filter Co., Inc., Louisville, Ky.

**Renuvent**—Steel Wool Filters. American Air Filter Co., Inc., Louisville, Ky.

**Republic**—Gas Conversion Burners. Autogas Corp., Chicago, Ill.

**Republic-Taylor**—Terne Roofing Plates. Republic Steel Corporation, Cleveland.

**Rex**—Bearings, Pillow Blocks, Blower-Filter Units, Fans and Ventilators. Air Controls, Inc., Cleveland.

**Rex**—Blowers. Air Controls, Inc., Cleveland.

**Rex**—Furnaces. Calkins & Pearce, Columbus, O.

**Rex**—Spot Welders. Dyer Welder & Engineering Co., Kansas City, Mo.

**Rex-Airate**—Fans, Ventilators. Air Controls, Inc., Cleveland, O.

**Rex-Air-Pak**—Blower Units. Air Controls, Inc., Cleveland, O.

**Rexco**—Refractories. Rex Clay Products Co., Detroit.

**Rexide**—Metal Protecting Paint. A. C. Horn Co., Long Island City.

**Rexoil**—Oil Burners, Furnaces. Reif-Rexoil, Inc., Buffalo, N. Y.

**Rex Vibra-Sorbers**—Vibration Eliminating Metal Hose. Chicago Metal Hose Corporation, Maywood, Ill.

**Reynolds**—Ducts and Duct Fittings. Richmond Radiator Co., Inc., Uniontown, Pa.

**Resistal**—Stainless Steels. Crucible Steel Co. of America, New York.

**Rhinamel**—Enamels. Tropical Paint & Oil Co., Cleveland.

**Rhino**—Caulking and Glazing Compounds. Pecora Paint Co., Philadelphia.

**Ridgolator**—Ridge Roof Ventilator. Klauer Mfg. Co., Dubuque, Ia.

**Rincon-trol**—Enamels and Lacquers. Roxalin Flexible Lacquer Co., Elizabeth, N. J.

**Rip-o-Lin**—Enamels. Glidden Company, Cleveland.

**Rip-pl**—Enamels, Lacquers and Paints. Hilo Varnish Corp., Brooklyn.

**Riverside**—Furnaces. Rock Island Stove Co., Rock Island, Ill.

**R.I.W.**—Paint and Waterproofing. Toch Bros., Inc., Elm Pk., S. I., N. Y.

**R. I. W. Liquir Konkert**—Paint. Toch Bros., Inc., Elm Pk., S. I., N. Y.

**R. I. W. Ping-A-Leak**—Roofing Paint. Toch Bros., Inc., Elm Pk., S. I., N. Y.

**Robinson**—Brakes, Presses and Dies, Punches. New Albany Machine Mfg. Co., New Albany, Ind.

**Rocan**—Copper Roofing and Sheets. Revere Copper and Brass Incorporated, New York City.

**Roche**—Paint Spray Guns. Binks Mfg. Co., Chicago.

**Rocktex**—Insulation. Phillip Carey Co., Lockland, Cincinnati, O.

**Rogers**—Brushing Lacquer. Acme White Lead & Color Works, Detroit.

**Bohaco**—Blowers, Pipe Fittings and Accessories, Furnaces, Grilles, Pipe, Registers, Heat Savers. Roberts-Hamilton Co., Minneapolis.

**Rollaire**—Air Conditioning Furnaces. Hi-point Corp., Bellefontaine, O.

**Roofkoter**—Paint. Tropical Paint & Oil Co., Cleveland, O.

**Roofloy**—Lead Roofing and Sheets. Revere Copper and Brass Incorporated, New York City.

**RoofSaver**—Roofing Nails. Dickson Weatherproof Nail Co., Evanston, Ill.

**Rotary Suction**—Ventilators. F. O. Schoedinger, Columbus, Ohio.

**Rotex**—Punches and Shears. M. Bollaert Oakland, Cal.

**Roto**—Insulating Cement and Combustion Chambers. Rex Clay Products, Co., Detroit.

**Roto-Blast**—Furnaces. Moncrief Furnace Co., Atlanta, Ga.

**Roto-Clone**—Dust Collectors. American Air Filter Co., Inc., Louisville, Ky.

**Roto-Grate**—Stokers. Standard Stoker Corporation, New Albany, Ind.

**Rotojet**—Nozzles. Binks Mfg. Co., Chicago, Ill.

**Roxaprene**—Enamels and Lacquers. Roxaline Flexible Lacquer Co., Inc., Elizabeth, N. J.

**Royal**—Caulking Compounds, Cement, Enamels, Lacquers, Waterproofing, Paint. A. Wilhelm Co., Reading, Pa.

**Royal**—Furnaces. Hart & Crouse Corporation, Utica, N. Y.

**Royalastic**—Roof Cement. A. Wilhelm Co., Reading, Pa.

**Royalbestos**—Furnace Cement. A. Wilhelm Co., Reading, Pa.

**Royal Blue**—Acid and Furnace Brushes. Schaefer Brush Mfg. Co., Milwaukee, Wis.

**Rubalt**—Enamels, Lacquers and Paint. Alfred Hague & Co., Inc., Brooklyn, N. Y.

**Rubyfluid**—Solder, Soldering Flux, Tinning Compounds. Ruby Chemical Co., Columbus, O.

**Rudico**—Furnaces. Rudy Furnace Co., Dowagiac, Mich.

**Rudisteel**—Furnaces. Rudy Furnace Co., Dowagiac, Mich.

**Rusco**—Windows. Russell Co., F. C., Cleveland.

## S

**S**—Sheets. The Superior Sheet Steel Co., Canton, Ohio.

**S-C**—Furnaces. Surface Combustion Corp., Toledo, O.

**S-E**—Gravity Roof Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.

**SF**—Soldering Coppers, Torches, Welders. Sight Feed Generator Co., Richmond, Ind.

**S. I. S.**—Cement. Barrett Div., Allied Chemical & Die Corp., New York City.

**S-L**—Bar Folders, Nibblers, Slitting Machines. St. Louis Tool Co., St. Louis.

**S-N**—Furnaces, Oil Burners. Scott-Newcomb, Inc., St. Louis, Mo.

**S O S**—Variable Speed Pulleys. Ideal Commutator Dresser Co., Sycamore, Ill.

**S.F.C.**—Metal Protecting Paint. L. Sonneborn Sons, Inc., New York City.

**Saf-ty**—Mallets. Martin Bersted Co., Chicago, Ill.

**St. Louis**—Stoker. Ormsby-Osterman Co., St. Louis.

**Sair Seal**—Insulating Cement. A. P. Green Fire Brick Co., Mexico, Mo.

**Sai-Mo**—Cement, Insulation, Pipe Coverings. Sall Mountain Co., Chicago, Ill.

**Samco**—Cement. Standard Asbestos Mfg. Co., Chicago, Ill.

**Sampson**—Furnace Brushes. Worcester Brush & Scraper Co., Worcester, Mass.

**Sanidair**—Humidifiers. U. S. Air Conditioning Corp., Minneapolis, Minn.

**Satis-Fyre**—Oil Burners. Shedlov Oil Burners, Inc., Minneapolis, Minn.

**Sauter**—Time Switches. R. W. Cramer Co., Inc., Centerbrook, Conn.

**Sav-Haf**—Oil Burners. Aldrich Co., Wyoming, Ill.

**Sav-T-Heat**—Air Conditioning Furnaces. C. A. Dunham Co., Chicago, Ill.

**Schmidt**—Soldering Coppers, Soldering and Brazing Torches. Minn-Kota Foundry & Mfg. Co., Fargo, N. D.

**Sco-Co**—Roof Cement, Compounds, Paint, Roofing and Waterproofing. Southport Paint Co., Savannah, Ga.

**Scroll-Pivoter**—Snips and Shears. Wiss & Sons Co., J., Newark, N. J.

**Scraplex**—Fans and Ventilators. L. J. Wing Mfg. Co., New York, N. Y.

**Seal-Cote**—Metal Protecting Lacquer. Fales Chemical Co., New York City.

**Sea-Lion**—Leather Belting. Chicago Belting Co., Chicago.

**Seal-Less**—Condensing Units. Westinghouse Electric & Mfg. Co., East Springfield, Mass.

**Seal Master**—Bearings. Stephens-Adamson Mfg. Co., Aurora, Ill.

**Seal of Quality**—Roofing. Columbia Steel Co., San Francisco, Cal.

**Sealpruf**—Waterproofing. General Insulating Products Co., Brooklyn.

**Seal-Tite**—Registers. Char-Gale Mfg. Co., Minneapolis.

**Seal-Tite**—Roof Cement. C. Arthur Miller & Son, Elmira, N. Y.

**Seamless**—Air Conditioners, Furnaces. Waterman-Waterbury Co., Minneapolis, Minn.

**Security**—Caulking and Roofing. National Mfg. Corp., Tonawanda, N. Y.

**Selectair**—Air Conditioning Units and Oil Furnaces. S. T. Johnson Co., Oakland, Cal.

**Self-Cleaning**—Furnaces. Moore Corp., Joliet, Ill.

**Self-Seal Re-Fill-Able**—Filters. Research Products Corporation, Madison, Wis.

**Selfvulo**—Waterproofing Compounds, Paint. Self-Vulcanizing Rubber Co., Inc., Chicago.

**Semco**—Presses and Dies, Punches. Service Machine Co., Elizabeth, N. J.

**Sensatherm**—Thermostats. Mercold Corp., Chicago.

**Sensitrol**—Electrical Relays. Weston Electrical Instrument Corp., Newark, N. J.

**Sentinel**—Floor Furnaces. Stoker-Lad, Inc., Tacoma, Wash.

**Sentry**—Furnaces. Payne Furnace & Supply Co., Beverly Hills, Cal.

**70 Serviceman**—Recording Thermostat. Jas. P. Marsh Corp., Chicago.

**Shield-Arc**—Electrodes and Welders. Lincoln Electric Co., Cleveland, O.

**Shock Absorbing**—Pillow Blocks. Triangle Mfg. Co., Oshkosh, Wis.

**Shock Pads**—Vibration Isolating Pads. B. T. Butterworth, Jr., New Canaan, Conn.

**Shower-Proof**—Paint. Calbar Paint & Varnish Co., Philadelphia, Pa.

**Shur-Flux**—Soldering Flux. McNamee Products, Glencoe, Ill.

**Shur-Heat**—Stokers. Air Conditioning & Stokers, Inc., St. Louis.

**Sievert**—Soldering Furnaces and Torches. Van Praag Sales, New York City.

**Silent**—Furnace Blowers. Air Conditioning Equipment Co., Minneapolis.

**Silent Air**—Fans and Blades. Belanger Fan & Blower Co., Detroit.

**Silentair**—Blowers, Filters. Gehri Co., Tacoma, Wash.

**Silentaire**—Window Ventilator and Filter Units. Berger Mfg. Div., Republic Steel Corp., Canton, Ohio.

**Silent-Auburn**—Oil Burners, Furnaces, Heaters. Auburn Burner Co., Auburn, Ind.

**Silent Automatic**—Louvers & Shutters. Airecon Industries, Inc., Detroit.

**Silentblu**—Gas Burners. Beck Engineering Combustion Company, St. Louis.

**Silere**—Fans. Aire-Foile Fan & Blower Company, Detroit, Mich.

**Sil-Fos**—Solder. Handy & Harman, New York City.

**Silicair**—Insulation. Western Silicair Products, Inc., Burbank, Cal.

**Silver-Seal**—Aluminum Paint. Asphalt Products Co., Syracuse, N. Y.

**Simplex**—Quadrants. Ohio Products Co., Cleveland.

**Simplex**—Humidifiers. Henry Kraker, Holland, Mich.

**Simplex**—Metal Ceilings. Wm. I. Lucius, New York City.

**Simplex**—Stoker. Stoker Products, Inc., Decatur, Ill.

**Sim-trol**—Smoke Pipe Draft Regulators. Simplex Mfg. Co., Fond du Lac, Wis.

**Sirocco**—Air Conditioning Units, Blowers, Fans, Washers, Wheels. American Blower Corp., Detroit.

**Slaters' Felt**—Insulation. Barrett Div. Allied Chemical & Die Corp., New York City.

**Smith & Hemenway**—Tools. Crescent Tool Co., Jamestown, N. Y.

**Slumberette**—Night Air Cooling Fan Units. Todd Air Conditioning Co., Inc., Bonner Springs, Kan.

**Snaplock**—Furnace Pipe. Reeves Steel & Mfg. Co., Dover, Ohio.

**Snapon**—Mouldings & Trim. John Lees Div., Serrick Corp., Muncie, Ind.

**Snap-Rite**—Ducts, Pipe and Fittings. Gray Metal Products Inc. Rochester, N. Y.

**Snap-Tite**—Damper Regulators, Clips and Tips. M. A. Gerett Corp., Milwaukee.

**Sno-Breeze**—Air Conditioning Units. Palmer Mfg. Corp., Phoenix, Ariz.

**Snug-Fit**—Coils. Hotstream Heater Co., Cleveland, O.

**Softweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland.

**Solaraire**—Air Conditioning Furnace. St. Louis Furnace Mfg. Co., St. Louis.

**Solid Asphalt**—Waterproofing. Ford Roofing Products Co., Chicago.

**Solid Comfort**—May-Fieberger Co., Newark, Ohio.

**Sono-O-Seal**—Insulation. General Insulating Products Co., Brooklyn.

**Sorocco**—Chimney Caps and Tops. Southbridge Roofing Co., Southbridge, Mass.

**Southaire**—Stokers. E. E. Souther Iron Co., St. Louis.

**Sovalkor**—Protecting Paint Metal. Socony Paint Products Co., New York City.

**Sovalex**—Metal Protecting Paint. Socony Paint Products Co., New York City.

**Spacesaver**—Heating Unit. Payne Furnace & Supply Co., Beverly Hills, Cal.

**Spando**—Waterproofing. Cheney Co., Ardmore, Pa.

**SpecO**—Soldering Flux. Pfanstiehl Chemical Co., Waukegan, Ill.

**Speed Clips**—Spring Steel Fastenings. Tinnerman Products, Inc., Cleveland.

**Spee Dee**—Coils. Air Controls, Inc., Cleveland, O.

**Speed-heat**—Furnaces. Marshall Furnace Co., Marshall, Mich.

**Speed Nuts**—Sheet Metal Nuts. Tinnerman Products, Inc., Cleveland.

**Speed-Up**—Concrete Waterproofing Cement. Hilo Varnish Corp., Brooklyn.

**Sphinx**—Blower-Filter Units, Burners, Furnaces. C. L. Bryant Corp., Cleveland, O.

**Spinner**—Ceiling Ventilators. Milcor Steel Co., Milwaukee.

**Spiralaire**—Oil Burners. Westinghouse Electric & Mfg. Co., East Springfield, Mass.

**Spirovane**—Ventilating Fans. Western Blower Co., Seattle, Wash.



**Spitfire**—Anthracite Stokers. Coal-O-Matic Stoker Co., Trucksville, Pa.

**Sprague**—Furnaces. Katelman Foundry & Mfg. Co., Council Bluffs, Ia.

**Sprayit**—Paint Guns and Humidifiers. Electric Sprayit Co., Sheboygan, Wis.

**Spra-Rite**—Nozzles. Binks Mfg. Co., Chicago, Ill.

**Spraymaker**—Humidifiers. Lennox Furnace Co., Marshalltown, Iowa.

**Stable-Arc**—Arc Welding Electrodes, Arc Welders. Lincoln Electric Co., Cleveland, O.

**Stack Heat**—Heat Savers. Robert Barclay, Inc., Chicago.

**Stainweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

**Sta-Lock**—Prefabricated Ducts and Duct Fittings. Chicago Furnace Supply Co., Chicago.

**Stamco**—Furnace Pipe, Fittings. Cincinnati Stamping Co., Cincinnati, O.

**Stamco**—Sheet and Plate Machinery. Streine Tool & Mfg. Co., New Bremen, Ohio.

**Standard**—Furnaces. Aladdin Heating Corp., Oakland, Cal.

**Standard**—Furnaces. Farris Furnace Co., Springfield, Ill.

**Standard**—Furnaces. Home Furnace Co., Holland, Mich.

**Standard**—Ventilators. Allen Corp., Detroit.

**Standard Topton**—Furnaces. Klein Stove Co., Philadelphia.

**Star**—Furnaces. Arcweld Mfg. Co., Inc., Seattle, Wash.

**Star**—Soldering Furnaces. Burgess Soldering Furnace Co., Columbus, O.

**Star**—Ventilators. Merchant & Evans Co., Philadelphia, Pa.

**Steelcore**—Galvanized Steel Shingles. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

**Steel-Fin**—Heating Colls. New York Blower Co., Chicago.

**Steel Mixture**—Baffles and Refractories. McLeod & Henry Co., Inc., Troy, N. Y.

**Sterling**—Beading Machines. F. L. Robertson, Buffalo.

**Sterling**—Evaporative Coolers and Compressors. Reynolds Mfg. Co., Springfield, Mo.

**Steward**—Presses and Dies. Ward Machinery Co., Chicago.

**Stewart**—Furnaces. Fuller-Warren Co., Milwaukee, Wis.

**Stic-Tite**—Cement Refractory & Insulation Corp., New York City.

**Stokabilt**—Air Conditioning Stoker Furnaces. American Foundry & Furnace Co., Bloomington, Ill.

**Stok-A-Timer**—Stoker Controls. Mercoid Corp., Chicago.

**Stoker Economy**—Stoker Furnaces. International Heater Co., Utica, N. Y.

**Stoker Fire**—Furnaces. McPherson Furnace & Supply Co., Portland, Ore.

**Stoker-Ola**—Stokers. Advance Appliance Co., Peoria, Ill.

**Stokerator**—Domestic Stokers. Northern Steel & Stoker Corp., Peoria, Ill.

**Stokerelay**—Relays. Minneapolis-Honeywell Regulator Co., Minneapolis.

**Stokol-Heat**—Furnaces. Schwitzer-Cummins Company, Indianapolis, Ind.

**Stokol Hydraulic**—Stokers. Schwitzer-Cummins Co., Indianapolis, Ind.

**Stokol Mercury**—Stokers. Schwitzer-Cummins Co., Indianapolis, Ind.

**StormSeal**—Roofing Steel. Columbia Steel Co., San Francisco, Cal.

**Stowaway**—Attic Furnaces. Lennox Furnace Co., Marshalltown, Ia.

**Strate-Edge**—Eaves Trough and Gutters. Milcor Steel Co., Milwaukee.

**Strato-Liminator**—Air Diffusers. Willster Air Devices Inc. Cleveland.

**Streamaire**—Air Conditioning Units and Coils. Young Radiator Co., Racine, Wis.

**Stream-Flo**—Ventilators. The Allen Corporation, Detroit.

**Streamline**—Furnaces. Aladdin Heating Corp., Oakland, Cal.

**Streamline**—Ridge Ventilators. H. H. Robertson Co., Pittsburgh.

**Streamline Heater**—Furnaces. Thermal Engineering Associates, Chicago.

**Sturdybender**—Presses. Cyril Bath & Co., Cleveland.

**Summer Comfort**—Attic Fans. Air Controls, Inc., Cleveland.

**Sunbeam**—Furnaces, Blower-Filters, Oil Burners, Heaters and Humidifiers. American Radiator and Standard Sanitary Corp., Pittsburgh.

**Sunbeam-Allerton**—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh.

**Sunbeam-Allerton Junior**—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh.

**Sunbeam-Arlington**—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh.

**Sunbeam-Cliffdale**—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh.

**Sunbeam-Clifton**—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh.

**Sunbeam-Kenwood**—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh.

**Sunbeam-Longwood**—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh.

**Sunbeam-Mohawk**—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh.

**Sunbeam-Seneca**—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh.

**Sunbeam-Shawnee**—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh.

**Sunbeam-Wyandotte**—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh.

**Sun Fuel-Master**—Furnaces and Heaters. J. V. Patten Co., Sycamore, Ill.

**Sunglo**—Furnaces. Moore Corp., Joliet, Ill.

**Sunrise**—Gas and Oil Burners. Kais Sunrise Works, Detroit, Mich.

**Super**—Hangers and Fittings. Royal-Apex Mfg. Corp., Brooklyn, N. Y.

**Superalr**—Air Conditioning Furnaces. St. Louis Furnace Mfg. Co., St. Louis.

**Superalr**—Blower-Filter Units. The Majestic Co., Huntington, Ind.

**Super Air Screws**—Ventilating Fans. Marathon Electric Mfg. Corp., Wausau, Wis.

**Superbrite**—Aluminum Paint. Acorn Refining Co., Cleveland.

**Superflex**—Furnaces, Heaters. Perfection Stove Co., Cleveland.

**Superfin**—Furnaces. American Fdry. & Furnace Co., Bloomington, Ill.

**Super Firma**—Gravity Roof Ventilators. W. F. Hirschman Co., Inc., Buffalo.

**Superheat**—Furnaces. Dallman Supply Co., Sacramento, Cal.

**Super-Quiet**—Oil Burners. Green Colonial Furnace Co., Des Moines, Ia.

**Superior**—Furnaces. Pacific Gas Radiator Co., Huntington Park, Cal.

**Superior**—Blowers. American Foundry & Furnace Co., Bloomington, Ill.

**Superior**—Soldering Furnaces and Torches. P. Wall Mfg. Supply Co., N. S. Pittsburgh.

**Superlife**—Furnace. Excelsior Steel Furnace Co., Chicago.

**Super Red Streak**—Furnace Vacuum Cleaners. National Super Service Co., Toledo, O.

**Super-Thermo**—Refractory. Chicago Fire Brick Co., Chicago.

**Super-X**—Roofing Nails. Republic Steel Corporation, Cleveland.

**Supreme**—Furnaces. American Furnace & Foundry Co., Milan, Mich.

**Supreme**—Furnaces, Heaters. Agricola Furnace Co., Inc., Gadsden, Ala.

**Supreme**—Furnaces. McPherson Furnace & Supply Co., Portland, Ore.

**Suredrane**—Roofing. Reeves Steel & Mfg. Co., Dover, Ohio.

**Surelok**—Furnace Pipe. Reeves Steel & Mfg. Co., Dover, Ohio.

**Sureweld**—Arc Welding Electrodes. National Cylinder Gas Co., Chicago.

**Surfaceol**—Waterproofing Compound. Gerard Chemical Co., Elizabeth, N. J.

**Surfaceweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland.

**Swedgers**—Packam Crimper Company, Mechanicsburg Ohio.

**Sylphon**—Damper Regulators, Thermostats and Valves. Fulton Sylphon Co., Knoxville, Tenn.

**Symetrex**—Waterproofing Compounds. A. C. Horn Co., Long Island City.

**Synchron**—Stoker Controls, Relays, Switches. Industrial Engineering Corp., Terre Haute, Ind.

**Synchron "600"**—Timing Machines and Motors. Hansen Mfg. Co., Inc., Princeton, Ind.

**Syncretizer**—School Room Heaters. John J. Nesbitt, Inc., Philadelphia.

**Symonds**—Registers. Front Rank Furnace Co., Div., Liberty Foundry Co., St. Louis.

## T

**taico**—Air Filters. Tuttle Air Filter Co., Inc., Louisville, Ky.

**Tag**—Controls, Humidistats, Hygrometers, Recorders, Thermometers, Thermostats and Gas Pressure Regulating Valves. C. J. Tagliabue Mfg. Co., Brooklyn.

**Tamanite**—Metal Conditioner. Tamms Silica Company, Chicago.

**Tamco**—Ventilators. Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.

**Tampico**—Filters. Chicago Filter Co., Joliet Ill.

**Tanco**—Paint. Thompson & Co., Pittsburgh, Pa.

**Taunton**—Rivets. John H. Graham & Co., Inc., New York City.

**Taylor**—Roofing Ternes. Republic Steel Corporation, Cleveland.

**Techni-Turn**—Duct Turning Vanes. Waterloo Register Co., Waterloo, Ia.

**Techni-vane**—Duct Turning Vanes. Waterloo Register Co., Waterloo, Ia.

**Technotrol**—Electric Clock Thermostat. White Mfg. Co., St. Paul, Minn.

**Tee Joint**—Pipe Fittings and Accessories. Milcor Steel Co., Milwaukee.

**Tem-Clock**—Controls. Penn Electric Switch Co., Goshen, Ind.

**Temco**—Furnaces. Tennessee Enamel Mfg. Co., Nashville, Tenn.

**Temlok**—Insulation. Armstrong Cork Co., Lancaster, Pa.

**Temperator**—Air Conditioning Units. C. A. Dunham Co., Chicago.

**Tempered-Aire**—Furnaces. Gar Wood Industries, Inc., Detroit, Mich.

**TempOsta-T**—Thermostats. D. & M. Mfg. Co., Midland Park, N. J.

**Tempryte**—Heat Insulating Windows. Truscon Steel Co., Youngstown, O.

**Temtrol**—Thermostats. Penn Electric Switch Co., Goshen, Ind.

**10-Plastic**—Caulking Compounds. Quigley Co., Inc., New York City.

**Tensulate**—Insulation. Tennessee Products Corp., Nashville, Tenn.

**Texrope**—V-Belts. Allis-Chalmers Mfg. Co., Milwaukee, Wis.



**Tharco**—Furnace Cement. The Armstrong Company, Detroit, Mich.

**"The Pacific"**—Furnaces. W. W. Rosebraugh Co., Salem, Ore.

**Therma-Flo**—Circulating Heaters. Utility Fan Corp., Los Angeles.

**Thermalfuel**—Furnaces. Beck Engineering Combustion Kompany, St. Louis.

**Thermidair**—Air Conditioning Units, Blowers, Coils, Furnaces, Louvres & Shutters. E. K. Campbell Heating Co., Kansas City, Mo.

**Thermix**—Blow Pipe Collectors. Pratl-Daniel Corporation, Port Chester, N. Y.

**Thermo**—Furnaces. American Furnace Co., St. Louis.

**Thermo**—Gas Soldering Furnace. Ward Machinery Co., Chicago.

**Thermo-Draulic**—Damper Motors. Perfex Corporation, Milwaukee.

**Thermo-Drip**—Humidifier. Automatic Humidifier Co., Cedar Falls, Ia.

**Thermo-Flex**—Registers. Middleton Mfg. & Sales Co., Minneapolis, Minn.

**Thermogas**—Furnaces. Beck Engineering Combustion Kompany, St. Louis, Mo.

**Thermogrip**—Soldering Coppers. Ideal Commutator Dresser Co., Sycamore, Ill.

**Thermofl**—Furnaces. Beck Engineering Combustion Kompany, St. Louis.

**Thermolator**—Heaters. Pacific Gas Radiator Co., Huntington Park, Cal.

**Thermomasters**—Air Conditioning Units. Carrier Corporation, Syracuse, N. Y.

**Thermopane**—Windows. Libbey-Owens-Ford Glass Co., Toledo, Ohio.

**Thermopaste**—Plastic Fire Brick. Chicago Fire Brick Co., Chicago, Ill.

**Thermopilot**—Controls. General Controls Co., Glendale, Cal.

**Thermotite**—Insulation. Coast Insulating Corp., Los Angeles.

**Thin-Man**—Registers. Register & Grille Mfg. Co., Inc., Brooklyn.

**Thor**—Electric Buffers, Nibblers and Shears. Independent Pneumatic Tool Co., Chicago.

**Thor**—Spray Paint Guns. Blinks Mfg. Co., Chicago.

**Thor Drill Champion**—Electric Drills. Independent Pneumatic Tool Co., Chicago.

**370 Special**—Paints. Thompson & Co., Pittsburgh, Pa.

**Threplex**—Flashing. Chase Brass & Copper Co., Incorporated, Waterbury, Conn.

**Thrift**—Time Switches. Tork Clock Co., Inc., Mt. Vernon, N. Y.

**Throway**—Filters. American Air Filter Co., Inc., Louisville, Ky.

**Tik Wheat**—Pipe Covering Paste. Clark Stek-O Corp., Rochester, N. Y.

**Timercoid**—Time Clock. Mercoid Corp., Chicago, Ill.

**Timerelay**—Relays. Minneapolis-Honeywell Regulator Co., Minneapolis.

**Time-Saver**—Damper Quadrants. Goese Mfg. Co., Milwaukee.

**Timetrol**—Switches. Penn Electric Switch Co., Goshen, Ind.

**Tin Loy**—Tinning Compounds. Eagle-Picher Lead Co., Cincinnati, O.

**Tinol**—Compounds and Soldering Flux. American Solder & Flux Co., Philadelphia, Pa.

**Tinzit**—Tinning Compounds. McNamee Products, Glencoe, Ill.

**Tite**—Caulking Compounds. J. H. Krehbiel Co., Chicago.

**Titelock**—Fittings and Accessories for Conductor, Eaves Trough and Gutter, Furnace Pipe, Copper Roofing, Metal Shingles and Tile. Milcor Steel Co., Milwaukee.

**TiteSeal**—Caulking Compounds. Radiator Specialty Co., Charlotte, N. C.

**Tobin Bronze**—Plates and Welding Rod. American Brass Co., Waterbury, Conn.

**Tomb Brand**—Insulation. Barrett Div., Allied Chemical & Die Corp., New York City.

**Toncan Iron**—Roofing, Sheets. Republic Steel Corp., Cleveland, O.

**Toolweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

**Top-Notch**—Furnaces. Excelsior Steel Furnace Co., Chicago.

**Torbulator**—Oil Burners. Round Oak Co., Dowagiac, Mich.

**Toridair**—Furnaces. Fraser and Johnston Co., San Francisco.

**Toridheat**—Blower-Filters, Oil Burners, Furnaces and Regulators. Cleveland Steel Products Corp., Cleveland, O.

**Tornado**—Furnace Vacuum Cleaners. Breuer Electric Mfg. Co., Chicago.

**Torpedo**—Skylights. Milcor Steel Co., Milwaukee, Wis.

**Torrid**—Soldering Furnaces and Torches. Geo. W. Diener Mfg. Co., Chicago.

**Torrid Zone**—Furnaces. Lennox Furnace Co., Marshalltown, Ia.

**Transite**—Pipe and Fittings. Johns-Manville, New York City.

**Transweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

**Trimtherm**—Thermostats. General Controls Co., Glendale Cal.

**Triple A**—Paints, Enamels and Lacquers. Quigley Co. Inc. New York City.

**Triple Drain**—Channel Roofing. Republic Steel Corp., Cleveland, O.

**Triple Lock**—Roofing Nails. The Deniston Co., Chicago.

**Triple-Mix**—Furnace Cement. J. H. Krehbiel Co. Chicago.

**Triplex**—Furnaces. Home Furnace Co., Holland, Mich.

**Triplife**—Furnaces. Williamson Heater Co., Cincinnati, O.

**Triptrol**—Controls. White Mfg. Co., St. Paul, Minn.

**Triumph**—Furnaces. Joseph Capps, Inc., South Gate, Cal.

**Trojan**—Furnaces and Stokers. Auburn Burner Co., Auburn, Ind.

**Tropic Breeze**—Furnaces. Dalzen Manufacturing Co., Detroit.

**Tropico**—Humidifiers. Roberts-Hamilton Co., Minneapolis, Minn.

**Truflex**—Thermostatic Bl-Metals. General Plate Div. Metals & Controls Corp., Attleboro, Mass.

**Tuffernell**—Paint. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

**Trussteel**—Registers. United States Register Co., Battle Creek, Mich.

**Turbo**—Air Washers. Bayley Blower Company, Milwaukee.

**Turbo-Lift**—Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.

**Turret**—Water Circulating Pumps. Yeomans Bros. Co., Chicago.

**Twin Baffle**—Burners. Lochinvar Products, Dearborn, Mich.

**Twin Contact**—Controls, Relays, Thermostats. Perfex Corporation, Milwaukee, Wis.

**Twin Control**—Oil Burners. Hueller Mfg. Co., Inc., H. J. Brooklyn, N. Y.

**Twin-Pyre**—Oil Burner. Aldrich Co., Wyoming, Ill.

**Twin Zephyr**—Humidifier. Maid-O'-Mist, Inc., Chicago, Ill.

**Tygon**—Metal Protecting Paint. U. S. Stoneware Co., Akron, Ohio.

**Tytecote**—Reflective Blanket Insulation. Specialty Converters, Inc., East Braintree, Mass.

## U

**U.S.**—Pipe Fittings, Grilles, and Registers. United States Register Co., Battle Creek, Mich.

**USG**—Built-Up Roofing and Roof Cement and Paint. United States Gypsum Co., Chicago, Ill.

**U.S.S.**—Roofing Sheets. Carnegie-Illinois Steel Corp., Pittsburgh, Pa.

**U.S.S. Carilloy**—Alloy Plates. Carnegie-Illinois Steel Corp., Pittsburgh.

**U. S. S. Columbia**—Roofing, Sheets. Columbia Steel Co., San Francisco.

**U.S.S. Stormseal**—Steel Roofing. Carnegie-Illinois Steel Corp., Pittsburgh.

**U-Loy**—Sheets. Republic Steel Corp., Cleveland, O.

**UMCO**—Furnaces. Union Manufacturing Co., Boyertown, Pa.

**Uniblade**—Blowers. Autovent Fan & Blower Div., Herman Nelson Corp., Chicago.

**Unicool**—Air Conditioning Units and Washers. Betz Air Conditioning Corp., Kansas City, Mo.

**Unifil**—Insulation. Robinson Insulation Co., Great Falls, Mont.

**Uni-Fin**—Grilles and Warm Air Registers. Barber-Colman Co., Rockford, Ill.

**Uniflex**—Roofing Paint. Acorn Refining Co., Cleveland.

**Uniflo**—Duct Turning Vanes, Grilles and Registers. Barber-Colman Company, Rockford, Ill.

**Unifloy**—Stainless Steel Sheets. Universal-Cyclops Steel Corp., Bridgeville, Pa.

**Unipack**—Blowers. American Machine Products Co., Marshalltown, Iowa.

**Unique**—Air Conditioning Furnace. Excelsior Steel Furnace Co., Chicago.

**Unique**—Gas Heaters. Palmer Mfg. Corp., Phoenix, Ariz.

**Unishear**—Portable Electric Shears. Stanley Electric Tool Div., The Stanley Works, New Britain, Conn.

**Unisorb**—Bases and Pads and Duct Insulation. Felters Co., Inc., Boston, Mass.

**Unitaire**—Air Conditioning Units for Stores. Westinghouse Electric & Mfg. Co., East Springfield, Mass.

**Uni-Therm**—Air Cond. Furnace. Utility Fan Corp., Los Angeles.

**Universal**—Air Filters. Hugo Mfg. Co., Duluth, Minn.

**Universal**—Angle Benders. Hossfeld Mfg. Co., Winona, Minn.

**Universal**—Bases. B. T. Butterworth, Jr., New Canaan, Conn.

**Universal**—Dial Damper. Parker-Kalon Corp., New York, N. Y.

**Unxld**—Damper Quadrants. Parker-Kalon Corp., New York, N. Y.

**Upson**—Rivets. Republic Steel Corp., Cleveland, O.

**usAIRco**—Air Conditioning Units, Blowers and Blower-Filter Units, Fans, Grilles, Washers and Blower Wheels. U. S. Air Conditioning Corp., Minneapolis.

**UTA-AMS**—Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.

**Utilus**—Kitchen Exhaust and Ventilating Fans. W. F. Hirschman Co., Inc., Buffalo, N. Y.

## V

**Vacu-Draft**—Forced Draft Blowers. Muncie Gear Works, Inc., Muncie, Ind.

**Valcalox**—Damper Regulators. Young Regulator Co., Cleveland.

**Valley Forge**—Cement. Ehret Magnesia Mfg. Co., Valley Forge, Pa.

**Vapoglas**—Humidifier Evaporating Plates. Skuttle Sales Co., Detroit.

**Vaporator**—Humidifiers. Rudy Furnace Co., Dowagiac, Mich.

**Vedoc**—Enamels. Ferro Enamel Corp., Cleveland.

**Vee-Clip**—Stainless Roof Fastening Clips. National Stainless Clip Corporation, New York City.

**Veelos**—Adjustable V-Belts. Mannheim Mfg. & Belting Co., Mannheim, Pa.

**Velometer**—Anemometers. Illinois Testing Laboratories, Inc., Chicago, Ill.

**Venetian**—Roofing Paint. Clinton Metallic Paint Co., Clinton, N. Y.

**Ventil-air**—Window Ventilator-Filter Units. Fairbanks, Morse & Co., Chicago.

**Vent-Rite**—Solenoid Valves. Anderson Products, Inc., Cambridge, Mass.

**Ventura**—Fans, Ventilators. American Blower Corp., Detroit, Mich.

**Venturi-Flow**—Air Diffusers, Ceiling Ventilators, Duct Turning Vanes. Barber-Colman Company, Rockford, Ill.

**Veri-Best**—Soldering Furnaces and Torches. Van Praag Sales, New York City.

**Vernois**—Furnaces and Heaters. Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.

**Vibrocork**—Bases. Armstrong Cork Co., Lancaster, Pa.

**Victor**—Blower-Filter Units, Furnaces, Humidifiers, Stokers. Hall-Neal Furnace Co., Indianapolis, Ind.

**Victorgas**—Gas Units. Hall-Neal Furnace Co., Indianapolis, Ind.

**Victoria**—Venetian Blinds. Bostwick-Goodell Co., Norwalk, Ohio.

**Victoroll**—Air Conditioning Furnaces. Hall-Neal Furnace Co., Indianapolis, Ind.

**Victorstoke**—Stoker Units. Hall-Neal Furnace Co., Indianapolis, Ind.

**Victory**—Oil Burners. Caloroll Burner Corp., Hartford, Conn.

**Vigoraire**—Furnaces. Marshall Furnace Co., Marshall, Mich.

**Viking**—Furnaces. Familian Pipe & Supply Co., Los Angeles, Cal.

**Visafame**—Oil Burner Controls. Mercold Corp., Chicago, Ill.

**Visi-Draft**—Draft Gauge. F. W. Dwyer Mfg. Co., Chicago.

**Vitalaire**—Portable Room Cooler. Ice Cooling Appliance Corp., Morrison, Ill.

**Vitra-Carlite**—Enamels and Lacquers. Hilo Varnish Corp., Brooklyn.

**Vitriset**—Furnace Cement. U. S. Stoneware Co., Akron, Ohio.

**Vitroliner**—Vent and Flue Pipe and Fittings. Condensation Engineering Corp., Chicago.

**Volcano**—Chimney Caps and Tops, Ventilators. Iwan Brothers, South Bend, Ind.

**Vortex**—Furnace Vacuum Cleaners. B. F. Sturtevant Co., Hyde Park, Boston, Mass.

**Vortex**—Spray Nozzles. Phillips Cooling Tower Co., Inc., New York City.

**Vulcan**—Stokers. Susquehanna Engineering Co., Bloomsburg, Pa.

**Vulcanite**—Roofing, and Roofing Cement. Certain-teed Products Corp., New York City.

**Vulcatex**—Caulking and Glazing Compounds. A. C. Horn Co., Long Island City, N. Y.

**Vulco**—V-type Belts and Pulleys. Gates Rubber Co., Denver, Colo.

## W

**WAW**—Tools. W. A. Whitney Mfg. Co., Rockford, Ill.

**Warco**—Refractories. Walsh Refractories Corp., St. Louis, Mo.

**Warco Moisturizer**—Humidifiers. W. A. Russell & Co., Bridgeport, Conn.

**Ward Zephyr**—Attic Fans. Edgar T. Ward Co., Inc., River Forest, Ill.

**Warrior**—Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.

**Watco**—Spray Nozzles. Water Cooling Corp., New York City.

**Waterbase**—Furnaces. Farris Furnace Co., Springfield, Ill.

**Water-Boy**—Humidifier Valves and Fittings. Maid-O'-Mist, Inc., Chicago, Ill.

**Waterbury**—Air Conditioners, Oil Burners, Pipe Fittings and Accessories, Furnaces and Heaters. Waterman-Waterbury Co., Minneapolis, Minn.

**Water-RAY-trola**—Oil-fired Water Heater. Ray Oil Burner Co., San Francisco.

**Waterseal**—Cement. Thompson & Co., Pittsburgh, Pa.

**Watertender**—Humidifier Valve. Skuttle Sales Co., Detroit.

**Wearweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

**Wearwell**—Paint. Thompson & Co., Pittsburgh, Pa.

**Weathermaker**—Air Conditioning Units. Carrier Corp., Syracuse, N. Y.

**Weathermaster**—Air Conditioning Units, Boiler Type. Carrier Corp., Syracuse, N. Y.

**Weather Master**—Stokers. Kol-Master Corporation, Oregon, Ill.

**Weatherwood**—Insulation. United States Gypsum Co., Chicago, Ill.

**Webster**—Spray Nozzles and Air Washers. W. J. Strandwitz & Co., Inc., Camden, N. J.

**Webster-Nesbitt**—Air Conditioning Units. Warren Webster & Co., Camden, N. J.

**Wedgbelt**—Belts and Pulleys. American Pulley Co., Philadelphia, Pa.

**Weir**—Air Conditioning Furnaces, Gravity Furnaces, Heaters, Humidifiers, Stokers. Meyer Furnace Co., Peoria, Ill.

**Weircoloy**—Copper Bearing Galvanized Sheets. Weirton Steel Co., Weirton, W. Va.

**Weirite**—Tin Plate. Weirton Steel Co., Weirton, W. Va.

**Weisco**—Skylight Lifts. H. Weiss & Co., New York, N. Y.

**Weldon**—Furnaces. McPherson Furnace & Supply Co., Portland, Ore.

**Weld-o-trol**—Spot Welders. Westinghouse Electric & Mfg. Co., East Pittsburgh.

**Weld-O-Tron**—Arc Welders. Allis-Chalmers Mfg. Co., Milwaukee.

**Wellsville Savage**—Fire Brick. Chicago Fire Brick Co., Chicago, Ill.

**Wesco**—Blower Filters. Northwest Stove & Furnace Works, Inc., Portland, Ore.

**Wesco Diamond**—Furnaces. Northwest Stove & Furnace Works, Portland, Ore.

**Wesco Duplex**—Utility Room Furnaces. Northwest Stove & Furnace Works, Portland, Ore.

**Wesco**—Furnaces. John Westwick & Son, Inc., Galena, Ill.

**Wesco**—Furnaces. Woods-Evertz Stove Co., Springfield, Mo.

**West Wind**—Window Fans. American Metal Products Co., Fort Worth, Tex.

**Westco**—Pumps. Micro-Westco, Inc., Bettendorf, Ia.

**Western Fan**—Roof Fan Ventilators. Western Engineering & Mfg. Co., Los Angeles.

**Western King**—Furnaces. Independence Stove & Furnace Co., Independence, Mo.

**Western Turbine**—Gravity Roof Ventilators. Western Engineering & Mfg. Co., Los Angeles.

**Whirlator**—Oil Burners. Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit, Mich.

**Whirljet**—Spray Nozzles. Spraying Systems Co., Chicago.

**Whiting**—Stokers. Eddy Stoker Corporation, Chicago.

**Whitney-JENSEN**—Angle Benders, Brakes, Elbow and Pittsburgh Lock Forming Machines, Punches, Shears and Tools. Whitney Metal Tool Co., Rockford, Ill.

**Whiz**—Electric Drills. Paramount Products Co., New York City.

**Wlechart**—Furnaces, Heaters. St. Clair Foundry Corp., Centralia, Ill.

**Wildergloss**—Smoke Pipe and Fittings. Wilder Mfg. Co., Niles, Ohio.

**Wilson**—Arc Welders. Air Reduction Sales Company, New York City.

**Wilson**—Furnace Brushes. Worcester Brush & Scraper Co., Worcester, Mass.

**Winair**—Fans. W. F. Hirschman Co., Inc., Buffalo, N. Y.

**Wind Electric**—Roof Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.

**Wind-O-Fan, Jr.**—Window Ventilating Fan. Chelsea Fan & Blower Co., Inc., Irvington, N. J.

**Wind-O-Vane Jr.**—Kitchen Exhaust Fans. B. F. Sturtevant Co., Hyde Park, Mass.

**Windostat**—Condensation Control. Julian P. Friez & Sons, Baltimore.

**Winkler**—Fans and Stokers. U. S. Machine Corporation, Lebanon, Ind.

**Winner**—Registers. Auer Register Co., Cleveland, O.

**Winter-Chaser**—Furnaces, Heaters. Campbell Heating Co., Des Moines, Ia.

**Winter King**—Furnaces. McPherson Furnace & Supply Co., Portland, Ore.

**Wissco**—Grilles and Gas Welding Rod. Wickwire Spencer Steel Co., New York City.

**Wizard**—Furnaces. Agricola Furnace Co., Inc., Gadsden, Ala.

**Wizardaire**—Air Conditioning Units. Certified Products Co., Toledo.

**Wolverine**—Fans, Blades. Belanger Fan & Blower Co., Detroit.

**Wolverine**—Furnaces. Marshall Furnace Co., Marshall, Mich.

**World**—Caulking Compounds. Ford Roofing Products Co., Chicago.

## X

**XL**—Metal Windows. Herrmann & Grace Co., Brooklyn, N. Y.

**X-L-All**—Coils, Furnaces. Deshler Foundry & Machine Works, Deshler, O.

**Xit**—Ventilators. Iona Ventilator Co., Inc., Philadelphia, Pa.

## Y

**Yager's**—Flux. Alex R. Benson Co., Inc., Hudson, N. Y.

**Yankee**—Dampers Clips and Tips. Howes-Woods Company, Charlestown, Boston.

**YarWay**—Nozzles. Yarnall-Waring Co., Philadelphia.

**Yearound**—Air Conditioning Units. Conditional Unit Co., Chicago.

**Yoloy**—Alloy Plates and Sheets. Youngstown Sheet & Tube Co., Youngstown, O.

**Yorkaire Conditioners**—Air Conditioning Units. York Ice Machinery Corp., York, Pa.

**Yorkaire Heat**—Furnaces. York Ice Machinery Corp., York, Pa.

**York-Heat**—Air Conditioning Units. York Oil Burner Co., Inc., York, Pa.

**YouBert**—Collectors and Blow Pipe Fittings. Young & Bertke Co., Cincinnati.

## Z

**Zeph-Air**—Gas Furnace. XXth Century Heating & Ventilating Co., Akron, Ohio.

**Zeph-Aire**—Window Fans. American Metal Products Co., Fort Worth, Tex.

**Zeph-Oil-Ator**—Air Conditioning Furnaces. Century Engineering Corp., Cedar Rapids, Ia.

**Zephyr**—A. C. Stoker Furnace. Premier Furnace Co., Dowagiac, Mich.

**Zero**—Furnace and Insulating Cement and Refractories. Standard Fuel Engineering Co., Detroit, Mich.

**Zilloy**—Zinc Roofing. New Jersey Zinc Co., New York City.

**Zim**—Filters. R. F. Zimmerman, Cincinnati, Ohio.

**Zinc Chromate Primer**—Metal Protecting Paint. Hilo Varnish Corp., Brooklyn.

**Zincgrip**—Steel Sheets. American Rolling Mill Co., Middletown, O.

**Zincoat**—Sheets. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

**Zoneair**—Furnaces. Payne Furnace & Supply Co., Inc., Beverly Hills, Cal.

**Zone King**—A. C. Furnaces. Century Eng. Corp., Cedar Rapids, Ia.

**Zonolite**—Cement, Combustion Chambers, Insulation and Refractories. Universal Zonolite Insulation Co., Chicago.

**Zonolite**—Insulation. Robinson Insulation Co., Great Falls, Mont.

**Z-Ro King**—Furnaces. Oakland Foundry Co., Belleville, Ill.

**Zura**—Roofing Paint. L. Sonneborn Sons, Inc., New York City.



Section of  
**American Artisan**  
**1942 DIRECTORY OF WARM AIR HEATING, RESIDENTIAL  
 AIR CONDITIONING AND SHEET METAL PRODUCTS**  
**[ Section 3—MANUFACTURERS' ADDRESSES ]**

**A**

●A-C Mfg. Co., Inc., 417 Sherman Ave., Pontiac, Ill.  
 Abbott Mfg. Co., Box 150, Painesville, O.  
 ●Accurate Mfg. Works, 2336-38 Milwaukee Ave., Chicago, Ill.  
 ●Accurate Metal Weather Strip Co., 216 E. 26th St., New York City.  
 Ace Engineering Co., 1735 W. 31st St., Chicago, Ill.  
 Acer & Whedon, Inc., Commercial St., Medina, N. Y.  
 ●Ackermann Manufacturing Company, Wheeling, W. Va.  
 Acme Asbestos Covering & Flooring Co., 222 Elizabeth St., Chicago, Ill.  
 ●Acme Electric Welder Co., 2618 Fruitland Rd., Los Angeles.  
 Acme Heating & Ventilating Co., 4224 S. Lowe Ave., Chicago, Ill.  
 Acme Industries, Inc., Cor. Mechanic & Ganson Sts., Jackson, Mich.  
 Acme Oil Burner Co., Inc., 210 Third Ave., S. W., Cedar Rapids, Ia.  
 Acme Refining Co., W. 56th & W&LE Ry., Cleveland, O.  
 Acme Tin Plate & Roofing Supply Co., 3rd & Westmoreland Sts., Philadelphia, Pa.  
 Acme White Lead & Color Works, 8250 St. Aubin Ave., Detroit.  
 Acorn Refining Co., 8001 Franklin Blvd., Cleveland, Ohio.  
 ●Adams Co., The, East 4th St., Dubuque, Ia.  
 Adams Mattress Factory, Fort Worth, Texas.  
 Adelta Manufacturing Co., Ellsworth St. at 21st, Philadelphia.  
 Adjustable Bearing Plate Co., 11 Rutger St., St. Louis, Mo.  
 Ad-Lee Co., Inc., 825 S. Wabash Ave., Chicago, Ill.  
 Advance Aluminum Castings Corp., 2742 W. 36th Pl., Chicago, Ill.  
 Advance Appliance Co., 808-810 Washington St., Peoria, Ill.  
 Advance Electric Co., 1260 W. 2nd St., Los Angeles, Cal.  
 Advance Fan & Blower Co., 3428 Bagley, Detroit, Mich.  
 Advance Insulating Co., 714 Magee Bldg., Pittsburgh, Pa.  
 Advanced Refrigerating Systems Co., 33rd & Arch Sts., Philadelphia.  
 Aeolus Dickinson, 3320 S. Artesian Ave., Chicago, Ill.  
 Aerofin Corp., 410 S. Geddes St., Syracuse, N. Y.  
 Aeroil Burner Co., Inc., Park Ave. at 57th St., West New York, N. J.  
 Aerovent Fan Co., 710 E. Ash St., Piqua, O.  
 Agnew Electric Co., Milford, Mich.  
 Agricola Furnace Co., Inc., North 12th St., Gadsden, Ala.  
 Ahlberg Bearing Co., 3025 W. 47th St., Chicago, Ill.  
 Air Conditioning Equip. Co., P. O. Box 1123, Minneapolis.  
 Air Conditioning Products Co., 1230 Eighteenth St., Detroit.  
 Air Conditioning & Stokers, Inc., 1610 Tower Grove Ave., St. Louis.  
 ●Air Control Products, Inc., Coopersville, Mich.  
 Air Controls, Inc., 2310 Superior Ave., Cleveland.  
 Air Devices, Inc., 17 E. 42nd St., New York City.  
 Airecon Industries Incorporated, 2648 Botsford Ave., Detroit.  
 Air Equipment Co., 2405 W. 44th St., Denver, Colo.  
 Air Filter Engineering Co., 2236 S. Wabash Ave., Chicago.  
 Aire-Folle Fan & Blower Co., 4737 W. Vernor Highway, Detroit, Mich.  
 AireOzone Corporation, 105 W. Madison St., Chicago.  
 Airtard Manufacturing Co., 609 N. La Salle St., Chicago, Ill.  
 Airmaster Corp., 4317 Ravenswood Ave., Chicago.  
 ●Air-Maze Corp., 5200 Harvard Ave., Cleveland, O.  
 Airmode Manufacturing Co., 325 W. Huron St., Chicago.  
 Air-O-Cell Industries, Inc., 11616 Cloverdale Ave., Detroit.  
 Air-O-Fin Grille Co., 19159 John R. St., Detroit.  
 Air-O-Line Co., The, 2118 Griffin St., Dallas, Tex.  
 Airox Company, 305 E. 46th St., New York City.  
 Air Reduction Sales Co., 60 E. 42nd St., New York City.  
 Air Stream Filter Corp., 2100 Washington Ave., St. Louis.  
 Air & Refrigeration Corp., 11 W. 42nd St., New York City.  
 Airtemp Div. Chrysler Corp., Leo St., Dayton, Ohio.  
 Airtherm Mfg. Co., 700 S. Spring Ave., St. Louis.  
 Airwasher Corporation, 1122 N. Washington Ave., Lansing, Mich.  
 Ajax Building Bracket Co., 1551 Rydal-Mount Rd., Cleveland Heights, O.  
 Ajax Flexible Coupling Co., Westfield, N. Y.

Akrat Ventilator Co., 1717 Carroll Ave., Chicago.  
 Aladdin Heating Corp., 2222 San Pablo Ave., Oakland, Cal.  
 Albright Equipment Co., 405 Penn Ave., Pittsburgh.  
 ●Alco Manufacturing Co., 2619 Milam St., Houston, Tex.  
 ●Alco Valve Co., 2628 Big Bend Blvd., St. Louis, Mo.  
 Alden Manufacturing Co., Painesville, Ohio.  
 Aldrich Co., Wyoming, Ill.  
 Aldrich Pump Co., Foot of Pine St., Allentown, Pa.  
 Alfol Insulation Co., Inc., 155 E. 44th St., New York City.  
 Allegheny Ludlum Steel Corp., Oliver Bldg. (22), Pittsburgh.  
 Allen Billmyre Corp., 136 Water St., South Norwalk, Conn.  
 Allen-Bradley Co., 1335 S. First St., Milwaukee, Wis.  
 ●Allen Co., L. B., 6702 Bryn Mawr Ave., Chicago, Ill.  
 ●Allen Corp., 9752 Erwin, Detroit, Mich.  
 Allied Heating & Air Conditioning Co., 14807 Condon Ave., Lawndale, Cal.  
 Allied Welding Crafts, Inc., 401 W. South St., Indianapolis, Ind.  
 Allington & Curtis Mfg. Co., 1500 Holland Ave., Saginaw, Mich.  
 Allis-Chalmers Manufacturing Company, Milwaukee.  
 Allis Co., Louis, 427 E. Stewart St., Milwaukee, Wis.  
 Allmetal Weatherstrip Co., 229 W. Illinois St., Chicago, Ill.  
 Allred Manufacturing Company, Inc., 2154 N. Sherman Dr., Indianapolis, Ind.  
 All States Roofers Equipment & Material Co., 2107 W. Lake St., Chicago, Ill.  
 Alpha Metal & Rolling Mills, Inc., 363 Hudson Ave., Brooklyn, N. Y.  
 Alphil Spot Welding Co., 431 W. Broadway, New York City.  
 Alter-Arc Mfg. Co., 209 B St., Lawton, Okla.  
 Alter Company, Harry, 1728 S. Michigan Ave., Chicago.  
 Alton Mineral Wool Insulation Co., P. O. Box 268, Alton, Ill.  
 Aluminum Aircell Insulation Co., 417 Curtis Bldg., Detroit.  
 Aluminum Co. of America, 801 Gulf Bldg., Pittsburgh.  
 Aluminum Goods Mfg. Co., Manitowoc, Wis.  
 American Agile Corporation, 5806 Hough Ave., Cleveland.  
 American Air Conditioning Co., 2831 Thirteenth Ave., Minneapolis.  
 American Air Conditioning Co., Boulevard Bldg., Detroit.  
 American Air Conditioning Corp., P. O. Box 29, Sebastopol, Cal.  
 ●American Air Filter Co., Inc., 113 Central Ave., Louisville, Ky.  
 American Barlock Co., Inc., 36-32 38th St., Long Island City, N. Y.  
 American Blower Corp., 6000 Russell St., Detroit, Mich.  
 ●American Brass Co., 414 Meadow St., Waterbury, Conn.  
 American Cabinet Hardware Corp., Rockford, Ill.  
 American Chain Division, American Chain & Cable Co., Inc., York, Pa.  
 American Chemical Paint Co., Brookside Ave., Ambler, Pa.  
 American Coal Burner Co., 155 E. Superior St., Chicago, Ill.  
 American Coils, Inc., 25-27 Lexington St., Newark, N. J.  
 American Coolair Corp., 3604 Mayflower St., Jacksonville, Fla.  
 American Cooling Tower Co., 2710 McGee St., Kansas City, Mo.  
 American Emblem Co., Inc., P. O. Box 116M, Utica, N. Y.  
 American Engineering Co., Aramingo Ave. & Cumberland St., Philadelphia.  
 American Excelsior Corp., 100-20 N. Halsted St., Chicago.  
 American Flange & Mfg. Co., Inc., 1901 RCA Bldg., Radio City, New York City.  
 American Flexible Coupling Co., 1801 Pittsburgh Ave., Erie, Pa.  
 American Foundry Equipment Co., 621 Byrkit St., Mishawaka, Ind.  
 American Foundry & Furnace Co., Washington at McClun St., Bloomington, Ill.  
 American Furnace Co., 2719-31 Delmar Blvd., St. Louis, Mo.  
 American Furnace & Foundry Co., Drawer E, Milan, Mich.  
 American Furnace Lighter Sales Company, 4541 Delmar Blvd., St. Louis.  
 American Gas Furnace Co., 140 Spring St., Elizabeth, N. J.  
 American Hair & Felt Co., 222 N. Bank Dr., Chicago, Ill.  
 American Humidair Corp., 951 Cherry St., S. E., Grand Rapids, Mich.

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American Instrument Co., 8010 Georgia Ave., Silver Spring, Md.  
 American Insulator Corp., New Freedom, Pa.  
 American-Larson Ventilating Co., 1004 Keystone Bank Bldg., Pittsburgh, Pa.  
 American Machine Products Co., 207-11 Market St., Marshalltown, Ia.  
 American-Marietta Company, 43 E. Ohio St., Chicago.  
 American-Marsh Pumps, Inc., 60 Capital Ave., N. E., Battle Creek, Mich.  
 American Metal Hose Branch, American Brass Co., 67 Jewell St., Waterbury, Conn.  
 American Metal Products Co., 730 Hudgins St., Fort Worth, Tex.  
 American Metal Weather Strip Co., 144 N. Division Ave., Grand Rapids, Mich.  
 American Moistening Co., 260 W. Exchange St., Providence, R. I.  
 American Nickeloid Co., 1505 Second St., Peru, Ill.  
 American Pulley Co., 4200 Wissahickon Ave., Philadelphia.  
 • American Radiator & Standard Sanitary Corp., P. O. Box 1226, Pittsburgh.  
 • American Rolling Mill Co., 703 Curtis St., Middletown, O.  
 American Schaeffer & Budenberg Instrument Div., Manning, Maxwell & Moore, Inc., 11 Elias St., Bridgeport, Conn.  
 American Screw Co., 21 Stevens St., Providence, R. I.  
 American Sheet Metal Works, 331 N. Alexander, New Orleans, La.  
 American Smelting and Refining Co., 120 Broadway, New York City.  
 American Solder & Flux Co., 2152 East Norris St., Philadelphia.  
 American Standard Gas Products Co., 11720 Cloverdale Ave., Detroit.  
 American Steel & Wire Co., 614 Superior Ave., N. W., Cleveland.  
 American Stove Company, Lorain Div., 1200 Long Ave., Lorain, O.  
 American Warming & Ventilating Co., 1017 Summit St., Toledo, O.  
 American Welding & Engineering Corp., 514 N. 9th St., Milwaukee, Wis.  
 American Wood Register Co., Novelty & Walnut Sts., Plymouth, Ind.  
 American Zinc Products Co., Greencastle, Ind.  
 Ames Co., W. R., 150 Hooper St., San Francisco, Cal.  
 Amirton Co., 27 Pearl St., New York City.  
 Anchor Stove and Range Co., Third & Culbertson, New Albany, Ind.  
 Anderson Corporation, Bayport, Minn.  
 Anderson Mfg. Co., 511 3rd, Des Moines, Ia.  
 Anderson Products, Inc., 17 Tudor St., Cambridge, Mass.  
 Andes Range & Furnace Corp., 117 Evans St., Geneva, N. Y.  
 Andrews Heating Company, 117-199 Main St., S. E., Minneapolis.  
 Andrews Lead Co., Inc., 30-48 Greenpoint Ave., Long Island City, N. Y.  
 Anemostat Corporation of America, 10 East 39th St., New York City.  
 Angell Nail & Chaplet Co., 4580 E. 71st St., Cleveland, O.  
 Annis Air Filters, 1515 Gardena Ave., Glendale, Cal.  
 Anti-Corrosive Metal Products Co., Inc., P. O. Box 788, Albany, N. Y.  
 Antigo Building Supply Co., Antigo, Wis.  
 Apex Excelsior Company, Dallas, Tex.  
 Apollo Metal Works, 66th Pl. & So. Oak Park Ave., Clearing Sta., Chicago.  
 Apollo Steel Co., 609-617 Warren Ave., Apollo, Pa.  
 Aqua-Mist Company, 426 Jefferson St., Topeka, Kansas.  
 Arcos Corp., 401 N. Broad St., Philadelphia, Pa.  
 Arcweld Mfg. Co., Inc., 3469 Third Ave. W., Seattle, Wash.  
 Arex Co., 333 N. Michigan Ave., Chicago.  
 Armstrong-Blum Mfg. Co., 5700 Bloomingdale Rd., Chicago.  
 • Armstrong Co., 241 S. Post St., Detroit, Mich.  
 Armstrong Cork Co., 992 Concord St., Lancaster, Pa.  
 Armstrong Furnace Co., 1649 Olentangy River Rd., Columbus, O.  
 Arrow-Hart & Hegeman Elect. Co., 103 Hawthorn St., Hartford, Conn.  
 Asphalt Products Co., Inc., Eastwood Sta., Syracuse, N. Y.  
 Associated Heater Parts Co., 3101 Wentworth Ave., Chicago.  
 Associated Southern Industries, 1161 Union Ave., Memphis, Tenn.  
 Atcheson Glass Co., T. J., 955 Main St., Buffalo, N. Y.  
 Athey Co., 6035 W. 65th St., Chicago.  
 Atkins & Co., E. C., 402 S. Illinois St., Indianapolis, Ind.  
 Atlantic India Rubber Works, Inc., 1453 W. Van Buren St., Chicago.  
 Atlantic Metal Hose Co., Inc., 123 W. 64th St., New York City.  
 Atlantic Steel Company, P. O. Box 1714, Atlanta, Ga.  
 Atlas Bolt & Screw Co., 1130 Ivanhoe Rd., Cleveland, O.  
 Atlas Heating & Ventilating Co., Ltd., 557 4th St., San Francisco, Cal.  
 Atlas Machine & Tool Co., 1721 N. E. Alberta St., Portland, Ore.  
 Atlas Valve Co., 282 South St., Newark, N. J.  
 Auburn Burner Company, Auburn, Ind.  
 Auburn Foundry, Inc., Stoker Div., Lock Box 471, Auburn, Ind.  
 • Auer Register Co., 3608 Payne Ave., Cleveland, O.

Au-Temp-Co Corp., 33 W. 60th St., New York City.  
 Autoforce Ventilating System, 244 Washington St., Boston.  
 Autogas Company, 2258 Diversey Ave., Chicago.  
 Auto-Heat Corporation, 311 W. 66th St., New York City.  
 Automatic Burner Corp., 1822 Carroll Ave., Chicago, Ill.  
 Automatic Gasflux Mfg. Co., 198 Wayne St., Mansfield, Ohio.  
 • Automatic Humidifier Co., 19th & Main Sts., Cedar Falls, Ia.  
 • Automatic Products Co., 2450 N. 32nd St., Milwaukee, Wis.  
 • Automatic Pump & Softener Corp., Rockford, Ill.  
 Automatic Stoker Corp., Indianapolis, Ind.  
 Automatic Stoker Corp., 2427 W. North Ave., Milwaukee, Wis.  
 Automatic Switch Co., 41 E. 11th St., New York City.  
 Automatic Temperature Control Co., Inc., 34 E. Logan St., Philadelphia.  
 Automatic Ventilator Company, 503 S. Shilawasse, Corunna, Mich.  
 Autovent Fan & Blower Div., Herman Nelson Corporation, 1807-19 N. Kostner Ave., Chicago, Ill.

## B

Babcock & Wilcox Co., 85 Liberty St., New York City.  
 Bacharach Industrial Instrument Co., 7000 Bennett St., Pittsburgh, Pa.  
 Bache & Co., Semon, Greenwich & Morton Sts., New York City.  
 Badger Mfg. Co., 106 N. Frances St., Madison, Wis.  
 Badger Mfg. & Sales Co., 743 N. 4th St., Milwaukee, Wis.  
 Baer Brothers, 438 W. 37th St., New York City.  
 Bahnsen Co., Reynolds Bldg., Winston-Salem, N. C.  
 Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland, O.  
 Baker Furnace & Cleaner Mfg. Co., 2505 Albion St., Toledo, O.  
 Baker Ice Machine Co., Inc., 1509 Evans St., Omaha, Nebr.  
 Baldor Electric Co., 4358 Duncan Ave., St. Louis, Mo.  
 Baldwin-Hill Company, 527 Klagg Ave., Trenton, N. J.  
 Ballantyne Co., 222 N. 16th St., Omaha, Nebr.  
 Ballofett Dies & Nozzle Co., Inc., 45-51 Adams St., Guttenberg, N. J.  
 Banner Repair Parts Co., 103 E. Indianola Ave., Youngstown, Ohio.  
 Bantam Bearings Corp., South Bend, Ind.  
 Barber Asphalt Corporation, Barber, N. J.  
 Barber Co., Inc., 1600 Arch St., Philadelphia.  
 Barber-Colman Co., River & Loomis Sts., Rockford, Ill.  
 • Barber Gas Burner Co., 3704 Superior Ave., Cleveland, O.  
 Barclay, Inc., Robt., 128 N. Peoria St., Chicago, Ill.  
 • Bard Mfg. Co., Evansport Road, Bryan, Ohio.  
 Bardes Range & Foundry Co., E. H., 2619 Colerain Ave., Cincinnati, O.  
 Barium Stainless Steel Corp., 1502 Allen Ave., S. E., Canton, O.  
 Barland Weatherstrip Material Co., 1960 E. 59th St., Cleveland, O.  
 Barnes Metal Products Co., 4425 W. 16th St., Chicago, Ill.  
 Barnes, W. O., 1297 Terminal Ave., Detroit.  
 Barrett Division, Allied Chemical & Die Corporation, 40 Rector St., New York City.  
 Barrett Engineers, 1322 Warrensville Center Rd., Cleveland Heights, O.  
 Barry Furnace Co., 208 N. B. St., Hamilton, O.  
 Bartlett Hayward Co., 200 Scott St., Baltimore.  
 Bartlett Mfg. Co., 3003 E. Grand Blvd., Detroit, Mich.  
 Bastian-Morley Co., Inc., LaPorte, Ind.  
 Bath & Company, E. 70th & Machinery Ave., Cleveland.  
 Bayer Co., A. J., Slauson & Santa Fe Aves., Los Angeles.  
 • Bayley Blower Co., 1817 S. 66th St., Milwaukee, Wis.  
 Beacon-Morris Corp., 702 Beacon St., Boston, Mass.  
 • Bead Chain Mfg. Co., 110 Mountain Grove St., Bridgeport, Conn.  
 Bear Mfg. Co., Rock Island, Ill.  
 Bearing Co. of America, Lancaster, Pa.  
 Beatrice Steel Tank Mfg. Co., 700 S. 7th St., Beatrice, Nebr.  
 Beatty Machine & Mfg. Co., 932 150th St., Hammond, Ind.  
 Beck Engineering Combustion Company, 3033 Spruce St., St. Louis, Mo.  
 Beckett Engineering Co., R. W., W. River St., Elyria, Ohio.  
 Beckley Perforating Co., 315 North Ave., Garwood, N. J.  
 Belanger Fan & Blower Co., 1230 18th St., Detroit.  
 Belco Exhaust Fan Mfg. Co., 3810 Olive St., St. Louis.  
 Belden Machine Company, 1108 Whalley Ave., New Haven, Conn.  
 Belfield Co., H., 435 N. Broad St., Philadelphia.  
 Bell & Gossett Co., Morton Grove, Ill.  
 Belmont Smelting & Refining Works, Inc., 281 Georgia Ave., Brooklyn, N. Y.  
 Bender Warrick Corp., 131 Pierce, Birmingham, Mich.  
 Benjamin Air Rifle Co., 1527 S. 8th St., St. Louis.  
 Benjamin Elec. Mfg. Co., Des Plaines, Ill.  
 Bennett Oil Company, 964 S. Saddle Creek Rd., Omaha, Neb.  
 • Benson Co., Inc., Alex R., 1040 S. Bay Rd., Hudson, N. Y.  
 • Berger Bros. Co., 229-237 Arch St., Philadelphia, Pa.  
 Berger Mfg. Div. of Republic Steel Corp., 1038 Belden Ave., N. E., Canton, O.  
 Bergstrom Mfg. Corp., Neenah, Wis.  
 Berns Specialty Company, 1015 W. Lake St., Chicago, Ill.  
 Bernz Co., Inc., Otto, 280 Lyell Ave., Rochester, N. Y.  
 Berry, Jr., F. E. & Co., Inc., Spring St., Everett, Mass.  
 Berryman Oil Burner Co., 1304 Washington Blvd., Chicago.  
 Bersted Co., Martin, 341 N. Crawford Ave., Chicago.  
 Bertram Mfg. Co., 230 E. Ohio St., Chicago, Ill.  
 Bertsch & Co., Church St., Cambridge City, Ind.  
 Best Register Co., 2005 W. Oklahoma Ave., Milwaukee, Wis.

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Bethlehem Foundry & Machine Co., Brodhead Ave. & Second St., Bethlehem, Pa.  
 ● Bethlehem Steel Co. (Incorporated), Bethlehem, Pa.  
 Betz Air Conditioning Corp., 1820 Wyandotte St., Kansas City, Mo.  
 Betz Corp., 460 State St., Hammond, Ind.  
 Beverly Throatless Shear Co., 3009 W. 110th Pl., Chicago.  
 Blen Air Conditioning Company, 1620 N. Spring St., Los Angeles.  
 Bliersach & Niedermeyer Co., 1937 N. Hubbard St., Milwaukee, Wis.  
 ● Biggs Supply Co., B. C., Lincoln, Nebr.  
 Binkley Mfg. Co., Warrenton, Mo.  
 Blinks Mfg. Co., 3114 Carroll Ave., Chicago, Ill.  
 Bird Archer Co., 4337 N. America St., Philadelphia.  
 Birmingham Fan Mfg. Co., Birmingham, Ala.  
 Bishop & Babcock Mfg. Co., 4901 Hamilton Ave., Cleveland.  
 Bittner Engineering Co., 18-32 E. 135th St., New York City.  
 Black & Decker Mfg. Co., Pennsylvania Ave., Towson, Md.  
 Black Servant Stoker Company, 3307 N. Broadway, St. Louis.  
 Blake & Johnson Co., Waterville, Conn.  
 Bliss Co., E. W., 1420 Hastings St., Toledo, O.  
 ● Blockson & Company, East Fifth St., Michigan City, Ind.  
 Blood Brothers, Div. Standard Steel Spring Co., Allegan, Mich.  
 Bluffton Mfg. Co., 433 W. Main Cross St., Findlay, O.  
 Blower Application Company, 918 N. Fourth St., Milwaukee.  
 Bodine Electric Co., 2254 W. Ohio St., Chicago, Ill.  
 Bogue Electric Co., 80 Glover Ave., Paterson, N. J.  
 Bohn Aluminum & Brass, Michigan Ave. & Shelby St., Detroit, Mich.  
 Bollaert, M., 3936 Rhoda Ave., Oakland, Cal.  
 Borm Manufacturing Company, Elgin, Ill.  
 Bossert Company, Inc., 1002 Oswego St., Utica, N. Y.  
 Boston Auto Gage Co., 70 West St., Pittsfield, Mass.  
 Boston Gear Wks., Inc., North Quincy, Mass.  
 Bostwick-Goodell Co., Norwalk, Ohio.  
 Botsfield Refractories Co., Swanson & Clymer Sts., Philadelphia.  
 Bovee Furnace Works, Waterloo, Iowa.  
 Boyd & Co., Inc., Chas. P., 250-252 W. Third St., Philadelphia.  
 Braden Mfg. Co., 431 N. 14th St., Terre Haute, Ind.  
 Brasco Manufacturing Co., 152nd & Commercial, Harvey, Ill.  
 ● Brauer Supply Co., A. G., 2100 Washington Ave., St. Louis.  
 Breidert, G. C., 3328 S. Central Ave., Los Angeles, Cal.  
 ● Bremil Mfg. Co., Box 1030, Erie, Pa.  
 Breuer Electric Mfg. Co., 5100 N. Ravenswood Ave., Chicago, Ill.  
 Bridesburg Foundry Co., Tacony & Duncan Sts., Philadelphia, Pa.  
 Bridgeport Brass Co., E. Main St., Bridgeport, Conn.  
 Bridgeport Chain & Mfg. Co., 964 Crescent Ave., Bridgeport, Conn.  
 Bridgeport Screw Co., Bridgeport, Conn.  
 Briggs Mfg. Co., 11631 Mack Ave., Detroit.  
 Briggs & Stratton, 2711 N. 13th St., Milwaukee.  
 Brigham Oil Burner Co., 3745 Forest Park Blvd., St. Louis.  
 Brillion Furnace Co., Brillion, Wis.  
 Bristol Co., Platts Bridge, Waterbury, Conn.  
 Brooklyn Metal Ceiling Co., 283-89 Greene Ave., Brooklyn, N. Y.  
 Bros Boiler & Mfg. Co., Wm., Nicollet Island, Minneapolis.  
 Brown-Appton Company, 631 Fifth Ave., New York City.  
 Brown-Brockmeyer Co., Inc., 1098 Smithville Rd., Dayton, O.  
 Brown Instrument Co., Div. Minneapolis-Honeywell Regulator Co., 4443 Wayne Ave., Philadelphia.  
 Brownell Co., N. Findlay St., Dayton, O.  
 Brownie Stoker Co., 840 N. Morgan St., Decatur, Ill.  
 Browning Mfg. Co., Inc., Maysville, Ky.  
 Brumme Mfg. Co., 314 S. Artesian Ave., Chicago, Ill.  
 ● Brundage Co., 500-514 N. Park St., Kalamazoo, Mich.  
 Brunner Mfg. Co., 1821 Broad St., Utica, N. Y.  
 Bryan Steam Corp., P. O. Box 337, Peru, Ind.  
 Bryant Corp., C. L., 4610 St. Clair Ave., Cleveland, O.  
 Bryant Heater Co., 17825 St. Clair Ave., Cleveland, O.  
 Bubar, Hudson H., 15 Park Row, New York City.  
 Buckeye Portable Tool Co., 25 West Apple St., Dayton, O.  
 Buckeye Products Co., 7024 Vine St., Cincinnati, O.  
 Buffalo Forge Co., 497 Broadway, Buffalo, N. Y.  
 Buffalo Pumps, Inc., 171 Mortimer St., Buffalo, N. Y.  
 Builders-Providence, Inc., 11 Coddling St., Providence, R. I.  
 Burdett Mfg. Co., 19 N. Sheldon St., Chicago, Ill.  
 Burgess Soldering Furnace Co., 292 E. Long St., Columbus, O.  
 Burke Electric Co., 1201 W. 12th St., Erie, Pa.  
 Burke Stoker & Mfg. Co., 921 W. 19th St., Chicago.  
 Burmester Gas Furnace Mfg. Co., 2117 Cumming St., Omaha, Nebr.  
 Burnham Boiler Corp., 1 Main St., Irvington, N. Y.  
 Burnham Stoker Co., 505 Columbia St., Vancouver, Wash.  
 Burnley Battery & Mfg. Co., Clay St., North East, Pa.  
 Burnside Steel Foundry Co., 1300 E. 92nd St., Chicago.  
 Burnwell Corp., 1113 N. 20th St., Allentown, Pa.  
 Burt Mfg. Co., 301 Main St., Akron, Ohio.  
 Bush Mfg. Co., 100 Wellington St., Hartford, Conn.  
 Butler Street Fdry. & Iron Co., 3422 Normal Ave., Chicago.  
 Butterworth, Jr., B. T., Oak Street, New Canaan, Conn.  
 Byers Co., A. M., Clark Bldg., Pittsburgh, Pa.  
 Byers Flashing Sales Division, 23 North Aberdeen, Chicago.

## C

C. & H. Air Conditioning Fan Co., Inc., Edgewood & Ivy Sts., N. E., Atlanta, Ga.  
 Cabot, Inc., Samuel, 141 Milk St., Boston, Mass.  
 Calbar Paint & Varnish Co., 2620 N. Martha St., Philadelphia, Pa.  
 Caldwell Co., W. E., 200 E. Brandeis, Louisville, Ky.  
 California Cornice, Steel and Supply Corp., 1620 N. Spring St., Los Angeles, Cal.  
 California Wire Cloth Corp., 1001 22nd Ave., Oakland, Cal.  
 Calkins & Pearce, 203-205 E. Long St., Columbus, O.  
 Callahan Can Machine Co., Inc., 80 Richards St., Brooklyn, N. Y.  
 Caloroll Burner Corp., 1477 Park St., Hartford, Conn.  
 Campbell, Andrew C., Division of American Chain & Cable Co., Inc., 929 Connecticut Ave., Bridgeport, Conn.  
 Campbell Heating Co., P. O. Box 833, Des Moines, Ia.  
 Campbell Heating Co., E. K., 2445 Charlotte St., Kansas City, Mo.  
 Campbell Machine Co., 2845 Harriet Ave., Minneapolis.  
 Canatsey Electric Manufacturing Co., 620 Wyandotte, Kansas City, Mo.  
 Canton Steel Ceiling Mfg. Co., 2280 Winfield Way, S. E., Canton, O.  
 Canton Stoker Corp., 507 Andrews Pl., S. W., Canton, O.  
 Canvas Products Co., 1236 S. 7th St., St. Louis.  
 Capitol Furnace & Stove Repair, 443 E. Washington St., Indianapolis, Ind.  
 Capps, Joseph, Inc., 3200 Ardmore St., South Gate, Cal.  
 Carbide and Carbon Chemicals Corp., 30 E. 42nd St., New York City.  
 Carbo-Oxygen Co., 221-223 Fourth Ave., Pittsburgh, Pa.  
 Carbondale Division, Worthington Pump & Machinery Corp., Harrison, N. J.  
 Carey Co., Philip, 408 Commercial Square, Cincinnati, O.  
 Carnegie-Illinois Steel Corp., Carnegie Bldg., Pittsburgh.  
 Carney Rockwool Co., Mankato, Minn.  
 Carpenter & Co., Geo. B., 440 N. Wells St., Chicago.  
 Carpenter Heating & Stoker Co., 1929 E. 55th St., Cleveland.  
 Carrier Corp., 302 S. Geddes St., Syracuse, N. Y.  
 Carter Paint Co., 310 N. Main St., Liberty, Ind.  
 Cartier & Sons Company, M. N., 275 Canal St., Providence, R. I.  
 Carty & Moore Eng. Co., 511 W. Larned St., Detroit.  
 Cary Mfg. Co., Waupaca, Wis.  
 Cellulose Products Div. Masonite Corp., 6565 S. LaVergne Ave., Chicago.  
 Celotex Corp., 919 N. Michigan Ave., Chicago, Ill.  
 Central Die Casting & Mfg. Co., Inc., 2935 W. 47th St., Chicago.  
 Central Furnace & Stove Repair Co., 3937 Olive St., St. Louis, Mo.  
 ● Central-West Machinery Co., 335 S. Western Ave., Chicago.  
 Central Wire & Iron Works, 621 E. Locust St., Des Moines, Ia.  
 ● Century Electric Co., 1806 Pine St., St. Louis, Mo.  
 Century Engineering Corp., Cedar Rapids, Ia.  
 Century Fan & Vent. Corp., 292 Locust Ave., New York City.  
 Certain-teed Products Corp., 100 E. 42nd St., New York City.  
 Certified Flexible Couplings, Inc., 122 E. 42nd St., New York City.  
 Certified Products Company, 2014 N. 14th St., Toledo.  
 Chace Co., W. M., 1606 Beard Ave., Detroit, Mich.  
 Chain Belt Co., 1613 W. Bruce St., Milwaukee.  
 Chain Tape Venetian Blind Co., Rockford, Ill.  
 Chalmers Oil Burner Co., 318 First Ave., North, Minneapolis.  
 Chamberlin Metal Weather Strip Co., 1254 La Brosse, Detroit, Mich.  
 Champion Blower & Forge Co., Harrisburg Ave. & Charlotte St., Lancaster, Pa.  
 Champion Furnace Pipe Co., 918 S. Adams St., Peoria, Ill.  
 ● Champion Tool Co., 376 W. 41st Place, Los Angeles, Cal.  
 ● Chandler Co., 804 1st Ave., N. W., Cedar Rapids, Ia.  
 Chapman Clay Co., Zanesville, O.  
 Chapman Slate Co., 546 Main St., Bethlehem, Pa.  
 Char-Gale Mfg. Co., 3127 Hiawatha Ave., Minneapolis, Minn.  
 Chase Brass & Copper Co., Incorporated, 236 Grand St., Waterbury, Conn.  
 Cheesman-Elliott Co., Inc., 639 Kent Ave., Brooklyn.  
 Chelsea Fan & Blower Co., Inc., 1206 S. Grove St., Irvington, N. J.  
 ● Cheney Co., Colonial Building, Ardmore, Pa.  
 Chicago Automatic Stoker Co., Inc., 14 N. Clinton St., Chicago, Ill.  
 Chicago Belting Co., 113 N. Green St., Chicago.  
 Chicago Die Casting Co., 2520 W. Monroe St., Chicago.  
 Chicago Expansion Bolt Co., 2240 W. Ogden Ave., Chicago.  
 ● Chicago Filter Co., Joliet, Ill.  
 Chicago Fire Brick Co., 1467 N. Elston Ave., Chicago, Ill.  
 Chicago Furnace Supply Co., 1278 Clybourn Ave., Chicago.  
 Chicago Hardware Foundry Co., 25th & Commonwealth Ave., North Chicago, Ill.  
 Chicago Metal Hose Corp., 1300 S. 3rd Ave., Maywood, Ill.  
 Chicago Metal Mfg. Co., 3720 S. Rockwell St., Chicago, Ill.  
 Chicago Perforating Co., 2445 W. 24th Pl., Chicago, Ill.  
 Chicago Pneumatic Tool Co., 6 E. 44th St., New York City.  
 Chicago Pump Co., 2330 Wolfram St., Chicago, Ill.  
 Chicago Rawhide Mfg. Co., 1312 Elston Ave., Chicago.

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Chicago Rivet & Mach. Co., 9600 W. Jackson Blvd., Bellwood, Ill.

Chicago Steel Foundry Co., Kedzie & 37th St., Chicago.

Chicago Steel Furnace Co., 7934 S. Chicago Ave., Chicago.

Chicago Venetian Blind Co., 3917 S. Michigan Ave., Chicago.

Choate Mfg. Co., 3464 Principio Ave., Cincinnati, Ohio.

Cincinnati Electrical Tool Co., The, 2684 Madison Rd., Cincinnati, O.

Cincinnati Mfg. Co., Gest & Evans Sts., Cincinnati, O.

Cincinnati Shaper Co., Hopple, Garrard & Elam, Cincinnati, O.

●Cincinnati Sheet Metal & Roofing Co., 230 E. Front St., Cincinnati, O.

Cincinnati Stamping Co., 28-34 W. McMicken Ave., Cincinnati, O.

Circulators & Devices Mfg. Corp., 100 Prince St., New York City.

●Clarage Fan Co., North & Porter Sts., Kalamazoo, Mich.

Clark Bros. Bolt Co., Milldale, Conn.

Clark Co., Henry N., 56-62 Union St., Boston.

Clark Controller Co., 1146 E. 152nd St., Cleveland, O.

Clark Dust Control Company, 210 N. Mozart St., Chicago.

Clark Jr., Electric Co., Jas., 600 Bergman St., Louisville, Ky.

Clark Stek-O Corp., 1631 Dewey Ave., Rochester, N. Y.

Clauss Shear Co., Fremont, O.

Clay Equipment Corp., Cedar Falls, Ia.

Clayton & Lambert Mfg. Co., 11111 French Rd., Detroit.

Cleveland Brush Factory, Inc., 7115 Dearborn Ave., S. W., Cleveland, O.

Cleveland Punch & Shear Works Co., E. 40th & St. Clair Ave., Cleveland, O.

Cleveland Steel Products Corp., Toridheet Div., Madison at W. 74th St., Cleveland.

●Climatemaker Slide Rule Service, Box 904, Bloomington, Ill.

Clinton Metallic Paint Co., P. O. Box 278, Clinton, N. Y.

Clizbe Bros. Mfg. Co., Plymouth, Ind.

Clough, A. W., 28 S. Broad St., Meriden, Conn.

Coal-O-Matic Stoker Co., Trucksville, Pa.

Coast Insulating Corp., 634 S. Western Ave., Los Angeles.

Cocking, Geo. J., 1336 W. 5th St., Santa Ana, Cal.

Colebrook & Sons, Inc., W. H., 246 Walton St., Syracuse, N. Y.

●Cole Hot Blast Manufacturing Co., 3108 W. 51st St., Chicago.

●Cole-Sullivan Engineering Company, 1316 Third St., North, Minneapolis, Minn.

Coleman Lamp & Stove Co., 2nd & St. Francis, Wichita, Kan.

Colonial Alloys Company, Sheet & Tube Div., 2154 E. Somerset St., Philadelphia.

Columbia Burner Co., 729 Ewing St., Toledo, O.

Columbia Mills, Inc., Saginaw, Mich.

Columbia Steel Co., (Sub. United States Steel Corp.) Russ Bldg., 235 Montgomery St., San Francisco, Cal.

Columbia Vari-Speed Co., 214 W. Wesley, Wheaton, Ill.

Columbian Enameling & Stamping Co., 1536 Beech St., Terre Haute, Ind.

Columbus Heating & Ventilating Co., 182 N. Yale Ave., Columbus, O.

Columbus Metal Products, Inc., 767 N. 4th St., Columbus, O.

Comfort Products Corporation, 7 W. 147th St., Harvey, Ill.

Commercial Shearing & Stamping Co., 1775 Logan, Youngstown, Ohio.

Commonwealth Electric Welder Mfg. Co., 3200 Oxford St., Philadelphia.

Compton Shear Co., W. H., 314 Camden, Newark, N. J.

●Conco Corporation, Mendota, Ill.

●Condensation Engineering Corp., 2515 S. Archer Ave., Chicago, Ill.

Conditionaire Unit Co., 2821 Montrose Ave., Chicago.

Congress Die Casting Div., Congress Tool & Die Co., 3750 East Outer Drive, Detroit.

Conklin Brass & Copper Co., Inc., T. E., 54-60 Laayette St., New York City.

Connor Eng. Corp., W. B., Dorex Div., 114 E. 32nd St., New York City.

Connors Paint Mfg. Co., Wm., 669-683 River St., Troy, N. Y.

Consolidated Car-Heating Co., Inc., Albany, N. Y.

Continental Diamond Fibre Co., Newark, Del.

Continental Electric Co., Inc., 323 Ferry St., Newark, N. J.

Continental Machines Incorporated, 1301 Washington Ave., South, Minneapolis.

Continental Products Co., 1150 E. 222nd St., Euclid, O.

Continental Rubber Works, 1900 Liberty Parkway, Erie, Pa.

Continental Screw Co., Mt. Pleasant, New Bedford, Mass.

●Continental Steel Corp., 1108 S. Main St., Kokomo, Ind.

Continental Stove Corp., Front & Walnut, Ironton, O.

Controlair, Inc., 607 West Ave., Elyria, Ohio.

Cook, Inc., A. D., Lawrenceburg, Ind.

●Cook Electric Co., 2700 Southport Ave., Chicago, Ill.

Coolmaster Corp., 530 S. Dearborn St., Chicago.

Cooper Co., Clark, Palmyra, N. J.

Cooper & Cooper, Inc., 37 Fenn St., Pittsfield, Mass.

Cooper Oven Thermometer Co., Pequabuck, Conn.

Copeland Refrigeration Corp., Sidney, Ohio.

Copper Roofs Corp., 5060 Plankinton Bldg., Milwaukee.

Copperweld Steel Co., Glassport, Pa.

Coppus Engineering Corp., 344 Park Ave., Worcester, Mass.

Corbin Screw Corp., 300 High St., New Britain, Conn.

Corbman Bros., Inc., 1205 N. Fourth St., Philadelphia, Pa.

Cork Import Corp., 330 W. 42nd St., New York City.

Cork Insulation Co., Inc., 155 E. 44th St., New York City.

Cornell Iron Works, Inc., 36th Ave. & 13th St., Long Island City, N. Y.

Coroaire Heating Corp., 1422 Euclid Ave., 1110 Hanna Bldg., Cleveland, O.

Cox Roofing Co., 1014 North-West Blvd., Winston-Salem, N. C.

Cramer Company, Inc., The R. W., Centerbrook, Conn.

Crane Co., 836 S. Michigan Ave., Chicago, Ill.

Crary Mfg. Co., 396 N. Second St., Middleport, O.

●Crescent Tool Co., 230 Harrison St., Jamestown, N. Y.

Crise Electric Mfg. Co., 2040 E. Main St., Columbus, Ohio.

Crocker-Wheeler Electric Mfg. Co., Ampere, N. J.

Cross Engineering Co., 160-178 Dundaff St., Carbondale, Pa.

Crouch Corporation, Birmingham, Mich.

Crowe Name Plate & Mfg. Co., 3701 Ravenswood Ave., Chicago.

Crown Fuel Saver Co., Richmond, Ind.

Crown Iron Works, 1229 N. E. Tyler, Minneapolis, Minn.

Crucible Steel Co. of America, 405 Lexington Ave., New York City.

Curtis Refrigerating Machine Co., 1946 Kienlen Ave., St. Louis, Mo.

Cutler-Hammer, Inc., N. 12th St. and W. St. Paul Ave., Milwaukee, Wis.

## D

D. & M. Mfg. Co., 51 Lincoln Ave., Midland Park, N. J.

Dahlstrom Metallic Door Co., S. E. Cor. E. Second & Buffalo Sts., Jamestown, N. Y.

Dallas Engineering Co., Inc., 2000 S. Akard, Dallas, Texas.

Dallman Supply Co., 6th & Q Sts., Sacramento, Cal.

Dalzen Manufacturing Co., 12255 E. Eight Mile Rd., Detroit.

Daniels Mfg. Co., Inc., Sam, Daniels Rd., Hardwick, Vt.

Danville Stove & Mfg. Co., Beaver St., Danville, Pa.

Davidson Hy Duty Roof Fan Co., Newton, Mass.

Davies Air Filter Corp., 118-120 E. 25th St., New York City.

Davis Regulator Co., 2546 S. Washtenaw Ave., Chicago.

Davy Fuel & Supply Co., Stoker Div., 14460 Dexter Blvd., Detroit.

Day Co., The, 2938 Pillsbury Ave., Minneapolis, Minn.

Day & Night Manufacturing Co., Monrovia, Cal.

Dayton Greenhouse Mfg. Co., P. O. Box 801, Dayton, O.

Dayton Pump & Mfg. Co., 500 N. Webster St., Dayton, O.

Dayton Rogers Mfg. Co., 2830 13th Ave., So., Minneapolis.

Dayton Rubber Mfg. Co., 2345 W. Riverview Ave., Dayton, O.

Debevoise Co., 968 Grand St., Brooklyn, N. Y.

De Bothezat Ventilating Equipment Division, American Machine and Metals, Inc., East Moline, Ill.

Decatur Iron & Steel Co., P. O. Box 72, Decatur, Ala.

Decatur Pump Co., 2750 Nelson Park Rd., Decatur, Ill.

Defender Automatic Regulator Co., 308 S. 8th St., St. Louis.

De Laval Steam Turbine Co., 300 Nottingham Way, Trenton, N. J.

De La Vergne Engine Co., 940 Simpson St., Eddystone, Pa.

Delco Appliance Div., General Motors Sales Corp., 391 Lyell Ave., Rochester, N. Y.

Delco Products Division, General Motors Corp., 329 E. First St., Dayton, O.

D'Elia Oil Burner Co., Inc., 145 Stratford Ave., Bridgeport, Conn.

Deming Co., 148 Aetna St., Salem, O.

Demuth & Sons, Charles, 112 New York Blvd., Jamaica, N. Y.

●Deniston Co., 4856 S. Western Ave., Chicago, Ill.

Densmore-Quinlan Co., 910 74th St., Kenosha, Wis.

Deshler Foundry & Machine Works, 140-142 S. East Ave., Deshler, O.

Des Moines Stove Repair Co., 107 S. W. Second St., Des Moines, Ia.

Detroit Air Conditioning Service Co., Inc., 1476 Holden St., Detroit.

Detroit Graphite Company, 550 Twelfth St., Detroit.

●Detroit Lubricator Co., 5900 Trumbull Ave., Detroit, Mich.

Detroit-Michigan Stove Co., 6900 E. Jefferson Ave., Detroit.

Detroit Moulding Div., 9210 Russell St., Detroit.

Detroit Safety Furnace Pipe Co., 5960 Second Blvd., Detroit.

Detroit Stamping Co., 350 Midland Ave., Detroit.

Detroit Steel Products Co., 2250 E. Grand Blvd., Detroit.

Detroit Stoker Co., General Motors Bldg., Detroit, Mich. (Sales & Engineering); Monroe, Mich. (Main Office & Works).

Detroit Surfacing Machine Co., 7433 W. Davison St., Detroit.

Detroit Torch & Mfg. Co., 12057 Cardoni Ave., Detroit.

De Vilbiss Co., 300 Phillips Ave., Toledo, O.

Devlin Mfg. Co., Thos., Burlington, N. J.

Devoe & Reynolds Company, Inc., 44th St. & 1st Ave., New York City.

Diamond Castings Co., Terra Cotta Rd., Johnsonburg, Pa.

Diamond Chain & Mfg. Co., 400 Kentucky Ave., Indianapolis, Ind.

Diamond Expansion Bolt Co., Inc., 500 North Ave., Garwood, N. J.

●Diamond Manufacturing Co., 243 W. 8th St., Wyoming, Pa.

Diamond Metal Weather Strip Co., 650 N. 4th St., Columbus, O.



Diceler Corp., Greenville, Pa.  
 Dick Co., Inc., R. & J., 24-48 Sade St., Passaic, N. J.  
 Dickey-Grabler Co., 10298 Madison Ave., Cleveland.  
 Dickson Co., 7420 Woodlawn Ave., Chicago.  
 Dickson Coal Co., 30 Rockefeller Plaza, New York City.  
 Dickson Weatherproof Nail Co., P. O. Box 466, Evanston, Ill.  
 Dieckmann Co., Ferdinand, 1180 Harrison St., Cincinnati, O.  
 Diehl Mfg. Co., Trumbull St., Elizabethport, N. J.  
 Diener Mfg. Co., Geo. W., 400 N. Monticello Ave., Chicago.  
 Disston & Sons, Inc., Henry, Unruh & Milner Sts., Tacony Sta., Philadelphia.  
 Dockson Corporation, 3847 Wabash Ave., Detroit.  
 Dodge Mfg. Corp., 500 S. Union St., Mishawaka, Ind.  
 Doheny Co., John J., 326 Lake St., Belmont, Mass.  
 Dornback Furnace & Fdry. Co., 724 E. 103rd St., Cleveland.  
 •Dowaglac Steel Furnace Co., Beeson St., Dowaglac, Mich.  
 Downs-Smith Brass & Copper Co., 304-320 E. 45th St., New York City.  
 •Doyle Vacuum Cleaner Co., 225 Stevens St., S. W., Grand Rapids, Mich.  
 Dracco Corp., 4057 E. 116th St., Cleveland, O.  
 Dragert Company, C. H., Inc., 237 India St., Brooklyn, N. Y.  
 Drayer & Hanson, Inc., 738 E. Pico Blvd., Los Angeles.  
 •Dreis & Krump Mfg. Co., 7404 Loomis Blvd., Chicago, Ill.  
 Dry-Zero Corporation, 222 W. North Bank Drive, Chicago.  
 Dual-Air Fan Corporation, 711 W. Lake St., Chicago.  
 Dual Remote Control Co., Wayne, Mich.  
 Dunham Co., C. A., 450 E. Ohio St., Chicago, Ill.  
 Dunn, Inc., Struthers, 1315 Cherry St., Philadelphia, Pa.  
 Duo-Therm Division, Motor Wheel Corporation, Lansing, Mich.  
 du Pont de Nemours & Co., E. I., Wilmington, Del.  
 Durakool, Inc., 1010 N. Main St., Elkhart, Ind.  
 Duraloy Co., Scottsdale, Pa.  
 Duriron Co., Inc., 450 N. Findlay St., Dayton, Ohio.  
 Duro Metal Products Co., 2649 N. Kildare Ave., Chicago, Ill.  
 Dusing & Hunt, Inc., 1927 Elmwood Ave., Buffalo, N. Y.  
 Dwyer Mfg. Co., F. W., 565 W. Washington St., Chicago.  
 Dyer Welder & Engineering Co., 7 E. 19th St., Kansas City, Mo.

**E**

Eagle-Picher Lead Co., Temple Bar Bldg., Cincinnati, O.  
 East Anaheim Sheet Metal Works, 2299 E. Anaheim Blvd., Long Beach, Cal.  
 Eastern Oil & Equipment Co., 133 Marginal Way, Portland, Me.  
 Eav-Tex Company, 1109 Garfield Ave., Upper Darby, Pa.  
 Eclipse Air Brush Company, Inc., 308 Park Ave., Newark, N. J.  
 Eclipse Aviation Div. Bendix Aviation Corp., Bendix, N. J.  
 Econ-O-Col Stoker Division of Cotta Transmission Corp., 2340 11th St., Rockford, Ill.  
 Economy Baler Co., 1020 N. Main St., Ann Arbor, Mich.  
 Economy Electric Manufacturing Co., 4634 W. 21st Pl., Cicero, Ill.  
 Economy Pumps, Inc., 2522 W. Congress St., Chicago.  
 Eddy Stoker Corp., 4717 W. North Avenue, Chicago.  
 Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.  
 Edwards Furnace Co., 25 East Ave., Wellsboro, Pa.  
 Edwards Mfg. Co., Inc., 337 Eggleston Ave., Cincinnati, O.  
 Ehret Magnesia Mfg. Co., Valley Forge, Pa.  
 Elermann Floor Scraper Co., 143 Irving Ave., Port Chester, N. Y.  
 Elker Mfg. Company, Ogallala, Nebr.  
 •Elsler Engineering Co., 761 S. 13th St., Newark, N. J.  
 Elco Tool & Screw Corporation, 1800 Broadway, Rockford, Ill.  
 Electric Arc, Inc., 152 Jelliff Ave., Newark, N. J.  
 Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland, O.  
 Electric Furnace-Man, Inc., 101 Park Ave., New York City.  
 Electric Machinery Mfg. Co., 1331 Tyler St., N. E., Minneapolis.  
 Electric Materials Co., Clay & Washington Sts., North East, Pa.  
 Electric Soldering Iron Co., Inc., Deep River, Conn.  
 Electric Sprayit Co., 15th & Illinois Aves., Sheboygan, Wis.  
 •Electric Vacuum Cleaner Co., Inc., 1734 Ivanhoe Rd., Cleveland, O.  
 Electric Valve Mfg. Co., Inc., 68 Murray St., New York City.  
 Electromatic Corp., 2109 S. Indiana, Chicago, Ill.  
 Electroalre Corp., 1455 W. Congress St., Chicago, Ill.  
 Electrogas Furnace Co., 2575 Bayshore Blvd., San Francisco.  
 Electrol Incorporated, 934 Main St., Clifton, N. J.  
 Electrovent Corp., 5245 Western Ave., Detroit, Mich.  
 Electrovent Fan & Mfg. Co., 812 W. Lake St., Chicago, Ill.  
 •Elgo Shutter & Mfg. Co., 6970 W. Jefferson Ave., Detroit.  
 Ellison Draft Gage Co., 214 W. Kinzie St., Chicago, Ill.  
 Elsey Metal Specialties Co., 1535 Spruce St., Detroit, Mich.  
 Emerson Electric Mfg. Co., 1843 Washington Ave., St. Louis.  
 Empire Door Co., Inc., 226 E. 144th St., New York City.  
 Empire Metal Co., 820 E. Water St., Syracuse, N. Y.  
 Empire Sheet & Tin Plate Co., N. Bowman St., Mansfield, O.  
 Empire Ventilation Equipment Co., 35-39 Vernon Blvd., Long Island City, N. Y.  
 Engelhard, Inc., Chas., 90 Chestnut St., Newark, N. J.

Engineering and Research Corporation, Riverdale, Md.  
 Enterprise Foundry Co., 1123 E. "B" St., Belleville, Ill.  
 Equipment Engineering Co., 2835 Columbus Ave., Minneapolis.  
 Erdle Perforating Co., 171 York St., Rochester, N. Y.  
 Ergolyte Mfg. Co., 3644 Lawrence St., Philadelphia.  
 Eselgroth & Co., 22 Edison Place, Newark, N. J.  
 Esko Mfg. Corp., 3409 McKinney St., Houston, Tex.  
 Essick Manufacturing Co., 1950 Santa Fe Ave., Los Angeles, Cal.  
 Estate Stove Co., Hamilton, O.  
 Etched Products Co., 3901 Queens Blvd., Long Island City.  
 Eugene Excelsior Company, Eugene, Ore.  
 Evanoll Heater Div., Evans Products Co., Union Guardian Bldg., Detroit.  
 Evans Corp., George, 121 37th St., Moline, Ill.  
 Everhot Mfg. Co., 57 S. 19th Ave., Maywood, Ill.  
 Everite Pump & Mfg. Co., Inc., 617 N. Price St., Lancaster, Pa.  
 Excello Oil Heating Corp., 111½ S. 24th St., Omaha, Nebr.  
 Excelsior Steel Furnace Co., 118 S. Clinton St., Chicago.  
 Excelsior Stove & Mfg. Co., 504 S. Front St., Quincy, Ill.  
 Excelsior Tool and Machine Co., 31st & Ridge Ave., East St. Louis, Ill.

**F**

Fafnir Bearing Co., 37 Booth St., New Britain, Conn.  
 Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago, Ill.  
 Fairfield Oil Heating Co., Inc., Mason St., Greenwich, Conn.  
 Fairmont Aluminum Co., Fairmont, W. Va.  
 Fales Chemical Co., Inc., 545 Fifth Ave., New York City.  
 Falstrom Co., Main Ave. & D. L. & W. R. R., Passaic, N. J.  
 Familian Pipe & Supply Co., 1101 Mateo St., Los Angeles.  
 Faraday Engineering Co., 56 Clearway St., Back Bay, Boston.  
 Fargo Foundry Co., 92 N. P. Ave., Fargo, N. D.  
 Farquhar Furnace Co., 150 Owens Ave., Wilmington, O.  
 •Farrell-Cheek Steel Company, Stoker Parts Div., First & Lane Sts., Sandusky, Ohio.  
 Farris Furnace Co., 920-930 Enos Ave., Springfield, Ill.  
 Faultless Heater Corp., 10403 St. Clair Ave., Cleveland, O.  
 Favorite Stove Co., 440 Weber St., Piqua, O.  
 Fedders Mfg. Co., Inc., 57 Tonawanda St., Buffalo, N. Y.  
 Federal Machine & Welder Co., 212 Dana St., Warren, O.  
 Federal-Mogul Corp., 11031 Shoemaker St., Detroit.  
 Fee & Mason Mfg. Co., 81 Beekman St., New York City.  
 Fee and Stemwedel, Inc., 1954 N. Western Ave., Chicago, Ill.  
 Felters Co., Inc., 210 South St., Boston, Mass.  
 Fern, Ralph, 2430 Boulevard Ave., Scranton, Pa.  
 Ferro Enamel Corporation, 4150 E. 56th St., Cleveland.  
 •Field Control Division, Mendota, Ill.  
 •Fidge Mfg. Co., 189 W. Madison St., Chicago, Ill.  
 Fingles Company, The, Reisetown Road at Elgin Ave., Baltimore, Md.  
 Finnell Rotary Stokers, Inc., 502 East St., Elkhart, Ind.  
 Fireline Stove & Furnace Lining Co., 1800 Kingsbury St., Chicago, Ill.  
 Firewood Machine Wks., Converse, Ind.  
 Firestone Tire & Rubber Co., Firestone Park, Akron, O.  
 Fir-Tex Insulating Board Co., St. Helena, Ore.  
 Fisher Governor Co., 203 S. First Ave., Marshalltown, Ia.  
 •Fitzgibbons Boiler Co., Inc., 101 Park Ave., New York City.  
 Flemm Lead Co., Inc., Bradley Ave. & School St., Long Island City, N. Y.  
 Flexo Supply Co., Inc., 4221 Olive St., St. Louis.  
 Flintkote Co., 50 W. 50th St., New York City.  
 Flood Company, 6217 Carnegie Ave., Cleveland.  
 Floral City Co., 402 S. Monroe St., Monroe, Mich.  
 Florence Stove Co., 205 School St., Gardner, Mass.  
 Floyd-Wells Co., Royersford, Pa.  
 Fluid Heat Division Anchor Post Fence Co., Eastern Ave. & Kane St., Baltimore.  
 Flynn & Emrich Co., 301 Holliday St., Baltimore, Md.  
 Follansbee Steel Corporation, 3rd & Liberty Aves., Pittsburgh.  
 Folsom Snow Guard Co., 80 Boylston St., Boston, Mass.  
 Foote Foundry Co., J. B., N. Main St., Fredericktown, O.  
 Ford Roofing Products Company, 111 W. Washington St., Chicago.  
 •Forest City Foundries Co., 2500 W. 27th St., Cleveland, O.  
 Forker Corporation, 4614 Prospect Ave., Cleveland.  
 Forman Air Conditioning & Engineering Co., 345 W. 40th St., New York City.  
 •Fossum Mfg. Co., M. H., 1795 St. Clair Ave., St. Paul.  
 Foster Wheeler Corp., 165 Broadway, New York City.  
 Fowler-Pem Co., 5317 Horton St., Emeryville, Cal.  
 Fox Control & Mfg. Co., 3589 E. 93rd St., Cleveland.  
 Foxboro Co., Neponset Ave., Foxboro, Mass.  
 Foy Stoker Mfg. Co., 1419 Diversey, Chicago.  
 Franklin Gas Heating Co., 1232 Vine St., Cincinnati, O.  
 Fraser and Johnston Co., 725 Potrero Ave., San Francisco.  
 •Frederick Iron & Steel Co., E. 7th & East Sts., Frederick, Md.  
 Freed Heater & Stoker Company, Collegeville, Pa.  
 Freed Products Co., 1510 Third Ave., Moline, Ill.  
 Fresh'nd-Aire Co., 210 N. Clinton St., Chicago.  
 •Frey & Co., Frank P., 2634 W. Madison St., Chicago.  
 Frick Co., Waynesboro, Pa.  
 Friedley-Voshart Co., 763 W. Lexington St., Chicago.  
 Friez & Sons, Julien P., 4 N. Central Ave., Baltimore.

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Frigidaire Div. Bendix Aviation Corp., General Motors Sales Corporation, 300 Taylor St., Dayton, O.  
 ●Front Rank Furnace Co., Div. Liberty Foundry Co., Sidney & Ohio Sts., St. Louis.  
 Fuel Savers Inc., 15th & Herr Sts., Harrisburg, Pa.  
 Fuller-Warren Co., 2506 N. 32nd St., Milwaukee, Wis.  
 Fulton Syphon Co., Knoxville, Tenn.  
 Furblo Co., Hermansville, Mich.  
 Furnaceslave, Inc., 1080 E. 52nd St., Indianapolis, Ind.

## G

●G. & O. Mfg. Co., 133 Winchester Ave., New Haven, Conn.  
 G. & S. Tool Co., 8790 Grinnell, Detroit, Mich.  
 G. D. S. Machinery & Supply Co., 101 Walker St., New York City.  
 Gale Products, Galesburg, Ill.  
 Gallaher Company, Owatonna, Minn.  
 Galva Heater Co., Galva, Ill.  
 Gammeter Co., W. F., Lincoln Ave. Extension, Cadiz, O.  
 ●Gar Wood Industries, Inc., 7924 Riopelle St., Detroit.  
 Garber Lumber & Construction Co., Strasburg, O.  
 Garden City Fan Co., 332 S. Michigan Blvd., Chicago, Ill.  
 Gardiner Metal Co., 2514 W. 48th Pl., Chicago, Ill.  
 Gardner Manufacturing Co., Lock Box 142, Horicon, Wis.  
 Gascol Furnace Co., The, 3126 Preble Ave., Pittsburgh.  
 Gasconaire, Inc., 3255 Goldner Ave., Detroit.  
 Gasoroll Mfg. Corp., Genoa City, Wis.  
 Gasweld Equipment Co., 625 W. Jackson Blvd., Chicago, Ill.  
 Gates Rubber Company Sales Div., Inc., 999 S. Broadway, Denver, Colo.  
 Gaul Air Conditioner Co., 3116 N. Main St., Dayton, Ohio.  
 ●Gehl Bros. Mfg. Co., West Bend, Wis.  
 Gehri Co., 1117 Tacoma Ave., Tacoma, Wash.  
 General Air Conditioning Corp., 4411 Appleton St., Cincinnati, Ohio.  
 General Aire Company, 118 N. Sixth St., Philadelphia.  
 ●General Blower Co., 403 N. Peoria St., Chicago.  
 General Blower Co., 5335 Market St., Philadelphia, Pa.  
 General Blower Corp., 1450 Army St., San Francisco.  
 ●General Controls Co., 801 Allen Ave., Glendale, Cal.  
 ●General Electric Co., Air Cond. Div., 5 Lawrence St., Bloomfield, N. J.  
 General Electric Co., 1 River Rd., Schenectady, N. Y.  
 General Equipment Co., 311-15-19 S. Wichita St., Wichita, Kan.  
 General Etching & Mfg. Co., 3076 W. Grand Ave., Chicago.  
 General Gas Light Co., Kalamazoo, Mich.  
 General Insulating Products Co., 8821 15th Ave., Brooklyn.  
 General Machine Co., Inc., Fourth & Furnace Sts., Emmaus, Pa.  
 General Machinery Co., 3500 Riverside Ave., Spokane, Wash.  
 General Metal Products Co., 3883 Delor St., St. Louis, Mo.  
 General Motors Corp., Moraine Products Div., Dayton, Ohio.  
 General Oil Heating Corp., 528 Jefferson St., West New York, N. J.  
 General Plate Div. Metals & Controls Corp., 34 Forest St., Attleboro, Mass.  
 General Refrigeration Division, Yates-American Machine Co., Shirland Ave., Beloit, Wis.  
 General Sales & Products Co., 242 Saratoga St., Cohoes, N. Y.  
 General Stokers, Inc., 6817 N. Franklin St., Philadelphia.  
 Gerard Chemical Co., 87 Front St., Elizabeth, N. J.  
 ●Gerrett Corp., M. A., 2947 N. 30th St., Milwaukee.  
 Gerhardt, W. F., 2007 W. Broad St., Richmond, Va.  
 Gerstein & Cooper Co., 1 W. Third St., South Boston, Mass.  
 Geuder, Paeschke & Frey Co., W. St. Paul Ave. and N. 15th St., Milwaukee, Wis.  
 Giant Mfg. Company, South Ave., Council Bluffs, Ia.  
 Gibraltar Engineering Co., 911 N. Orange Dr., Los Angeles.  
 Gilbert & Barker Mfg. Co., Springfield, Mass.  
 Gilbert & Son, Harry E., 220 Brooklawn Terrace, Bridgeport, Conn.  
 ●Gillen Company, J. L., Dowagiac, Mich.  
 Gillian Mfg. Co., 7752 Dubois St., Detroit.  
 Gilmer Co., L. H., Cottman & Keystone Sts., Tacony, Philadelphia, Pa.  
 Gilmore, Jackson E., 167 E. State St., Columbus, Ohio.  
 Glasby Manufacturing Co., Inc., J. P., Locust Ave. & Nelson St., Bloomfield, N. J.  
 Glaser Lead Co., Inc., 31 Wyckoff Ave., Brooklyn, N. Y.  
 Gleason-Avery, Inc., 27 Clark St., Auburn, N. Y.  
 Glidden Co., 11001 Madison Ave., Cleveland, O.  
 Globe Iron Roofing & Corrugating Co., Newport, Ky.  
 Globe Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.  
 Globe Machinery & Supply Co., East 1st & Court Ave., Des Moines, Ia.  
 G. M. Mfg. Co., 248 Lafayette St., New York City.  
 Goese Mfg. Co., 2548 N. 18th St., Milwaukee, Wis.  
 Goethel Co., Alfred C., 2337 N. 31st St., Milwaukee, Wis.  
 Goethel Sheet Metal Works, Alfred, 1912 N. Killian Pl., Milwaukee, Wis.  
 Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.  
 Goldens' Foundry & Machine Co., P. O. Box 96, Columbus, Ga.  
 Gold Seal Furnace Co., 234 S. Fourth St., Minneapolis, Minn.  
 Gold Star Oil Burner Mfg. Co., Inc., 146 Warburton Ave., Yonkers, N. Y.

Goodrich Co., B. F., 500 S. Main St., Akron, O.  
 Goodyear Tire & Rubber Co., 1144 E. Market St., Akron, O.  
 Gould Engineering Co., 110 Brookline Ave., Cambridge, Mass.  
 Goulds Pumps, Inc., Fall St., Seneca Falls, N. Y.  
 Governair Corp., 605 W. Main St., Oklahoma City, Okla.  
 Grabler Manufacturing Co., 6565 Broadway, Cleveland.  
 Graham & Co., Inc., John H., P. O. Box 1042 Church St. Annex, New York City.  
 Grainger, Inc., W. W., 815 W. Congress St., Chicago.  
 Grammes & Sons, Inc., L. F., 388 Union St., Allentown, Pa.  
 Grand Rapids Blow Pipe and Dust Arrester Co., 525 Monroe Ave., Grand Rapids, Mich.  
 Grand Rapids Die & Tool Co., 118-117 Michigan St., Grand Rapids, Mich.  
 Grand Rapids Wire Products Co., 503 Front Ave., N. W., Grand Rapids, Mich.  
 Granite City Steel Co., 20th & Madison Ave., Granite City, Ill.  
 ●Grant Wilson, Inc., 4101 W. Taylor St., Chicago.  
 Gray, G. L., 507 Grand Ave., New Haven, Conn.  
 Gray Metal Products, Inc., 30 Carlton St., Rochester, N. Y.  
 Great Lakes Steel Corporation, Ecorse, Detroit.  
 Great National Air Conditioning Corp., 1305 S. Lamar St., Dallas, Tex.  
 Green Colonial Furnace Company, 322 S. W. Third St., Des Moines, Ia.  
 Green Fire Brick Co., A. P., Mexico, Mo.  
 Green Mfg. Co., 605 W. Washington St., Chicago.  
 Greene, Tweed & Co., 101 Park Ave., New York City.  
 Greenlee Tool Co., Rockford, Ill.  
 Grinnell Co., Inc., 260 W. Exchange St., Providence, R. I.  
 Griacom-Russell Co., The, 285 Madison Ave., New York City.  
 Griawold Mfg. Co., 1001-1065 W. 12th St., Erie, Pa.  
 Grob Brothers, Grafton, Wis.  
 Grobet File Corp. of America, 3 Park Place, New York City.  
 Grossenbacher Furnace Co., 9410 Milton Ave., St. Louis.  
 Guardian Electric Mfg. Co., 1621 W. Walnut St., Chicago.  
 Guardian Utilities Co., 215 E. Michigan St., Michigan City, Ind.  
 Guth Co., Edwin F., 2615 Washington Blvd., St. Louis.

## H

H-B Instrument Co., Inc., 2518 N. Broad St., Philadelphia.  
 H P L Mfg. Co., 2015 E. 65th St., Cleveland.  
 Hague & Co., Inc., Alfred, 227 34th St., Brooklyn, N. Y.  
 Hall Mfg. Co., Cedar Rapids, Ia.  
 ●Hall-Neal Furnace Co., 1324 N. Capitol Ave., Indianapolis, Ind.  
 Hallstead Iron Foundry, Hallstead, Pa.  
 Hamilton Automatic Stoker Corp., 1637 Dixie Highway, Hamilton, O.  
 Hammett Electric Mfg. Co., 209 W. 19th Ter., Kansas City, Mo.  
 Hammond Aircraft Corp., South San Francisco, Cal.  
 Hammond Machinery Builders, 1626 Douglas Ave., Kalamazoo, Mich.  
 Hampton Elec. Tool Co., 700 Walnut St., Edgewood, Pittsburgh, Pa.  
 Handelan Washed Air Co., 305 S. Fifth St., Minneapolis.  
 Handley Brown Heater Co., 209 E. Washington Ave., Jackson, Mich.  
 Handy & Harman, 82 Fulton St., New York City.  
 ●Hansen Mfg. Co., Inc., Princeton, Ind.  
 Hardinge Oil Burner Co., 1770 Berteau St. at Ravenswood, Chicago, Ill.  
 Hare Stoker Corp., 4853 Rivard St., Detroit, Mich.  
 Harnischfeger Corp., 4400 W. National Ave., Milwaukee.  
 ●Harrington & King Perforating Co., 5649 Fillmore St., Chicago, Ill.  
 Harris, A. R., 4546 Hohman Ave., Hammond, Ind.  
 Harris Caloric Co., 5501 Cass Ave., N. W., Cleveland, O.  
 ●Hart & Cooley Mfg. Co., Holland, Mich. Chicago Office, 61 W. Kinzie St.  
 Hart & Crouse Corporation, 301 Turner St., Utica, N. Y.  
 Hart Mfg. Co., Bartholomew & Hamilton Sts., Hartford, Conn.  
 Hart Mfg. Co., 2006 N. Western Parkway, Louisville, Ky.  
 Hart Oil Burner Corp., 2200 N. Adams St., Peoria, Ill.  
 Hartzell Propeller Fan Co., 1025 Roosevelt Ave., Piqua, O.  
 Harvey, Inc., Sld, Valley Stream, N. Y.  
 Harvey-Whipple, Inc., 55 Emery St., Springfield, Mass.  
 Haskins Co., R. G., 615 S. California Ave., Chicago.  
 Hassall, Inc., John, Clay & Oakland Sts., Brooklyn, N. Y.  
 Hastings Air Conditioning Company, Inc., Box 474, 108 S. Colorado Ave., Hastings, Nebr.  
 Hauserman Co., E. F., 6800 Grant Ave., Cleveland.  
 Hays Corp., E. Eighth St., Michigan City, Ind.  
 Hays Mfg. Co., 801 W. 12th St., Erie, Pa.  
 Heartley Machine & Tool Co., 900-8 Summit St., Toledo, O.  
 Heath & Milligan Mfg. Co., Div. of The Glidden Co., 1833 S. Normal Ave., Chicago, Ill.  
 Heating Assurance, E. 124 Augusta, Spokane, Wash.  
 Heating Equipment Co., 1123 Harrison St., San Francisco.  
 Heatlox Furnaces, Inc., 4320 S. Tacoma Way, Tacoma, Wash.  
 Heatseal Burner Co., 2501 Leavenworth St., Omaha, Nebr.  
 Hegeler Zinc Co., P. O. Box 599, Danville, Ill.  
 Hell Co., 3000 W. Montana St., Milwaukee, Wis.  
 Hemp Co., Macomb, Ill.  
 Hendley & Whittemore Co., 6 Blackhawk Blvd., Beloit, Wis.



Hendrick Mfg. Co., 37 Dundaff St., Carbondale, Pa.  
 Henry & Wright Mfg. Co., 760 Windsor St., Hartford, Conn.  
 ● Henry Furnace & Foundry Co., 3473 E. 49th St., Cleveland, O.  
 Herbert & Sons, T. L., 6th & Harrison St., Nashville, Tenn.  
 Herbusch Corporation, The, Simplex Control Div., 706 Chestnut St., St. Louis.  
 ● Herco Oil Burner Corp., 109 Chestnut St., Lancaster, Pa.  
 Hercules Chemical Co., Inc., 332 Canal St., New York City.  
 ● Heremetal Co., 135 Aldrich Ave., N., Minneapolis.  
 Heritage Stoker Sales, Inc., 105 E. 63rd St., Chicago, Ill.  
 Herrmann & Grace Co., 671 Bergen St., Brooklyn, N. Y.  
 Herron-Zimmers Molding Co., 3900 E. Outer Drive, Detroit.  
 Hess-Snyder Co., Massillon, Ohio.  
 ● Hess Warming & Ventilating Co., 1221-1227 S. Western Ave., Chicago, Ill.  
 Hetzel Roofing Products Co., 67 Main St., Newark, N. J.  
 Hexacon Electric Company, 161 W. Clay, Roselle Park, N. J.  
 Higgin Products, Inc., Newport, Ky.  
 Hill Co., E. Vernon, 6628 W. Highland Ave., Chicago, Ill.  
 Hilo Varnish Corp., 42-60 Stewart Ave., Brooklyn, N. Y.  
 Hinde & Dausch Paper Co., P. O. Box 861, Sandusky, O.  
 Hipoint Corp., Water, Elm & Arnold Sts., Bellefontaine, O.  
 Hirschman Co., Inc., W. F., 220 Delaware Ave., Buffalo, N. Y.  
 Hobart Brothers Co., Canal Lock Square, Troy, O.  
 Hodel Chain Co., 3924 Cooper Ave., Cleveland.  
 Hoffman Combustion Eng., Co., 710 Marquette Bldg., Detroit.  
 Hoffman Specialty Co., Inc., 1001 York St., Indianapolis, Ind.  
 Holcomb & Hoke Mfg. Co., 1545 Van Buren St., Indianapolis, Ind.  
 Hollup Corp., Div. National Cylinder Gas Co., 3357 W. 47th Place, Chicago.  
 Holly Heating & Mfg. Co., 1000 Fair Oaks Ave., So. Pasadena, Cal.  
 Holtum Mfg. Co., Freeport, Ill.  
 Holtzer-Cabot Electric Co., 125 Amory St., Boston, Mass.  
 Home Furnace Co., 6th St. & P. M. R. R., Holland, Mich.  
 Home Stove Co., 501 Kentucky Ave., Indianapolis, Ind.  
 ● Homer Furnace & Foundry Corporation, Coldwater, Mich.  
 Hones, Inc., Charles A., 122 S. Grand Ave., Baldwin, N. Y.  
 Hood Co., B. Mifflin, Daisy, Tenn.  
 Horn Co., A. C., 43-36 Tenth St., Long Island City, N. Y.  
 Horton Mfg. Co., 3008 University Ave., S. E., Minneapolis.  
 Hossfeld Mfg. Co., Winona, Minn.  
 Hotentot Co., Inc., 2423 Farnam St., Omaha, Nebr.  
 Hotstream Heater Co., 8007 Grand Ave., Cleveland, O.  
 Hough Shade Corporation, 1027 S. Jackson St., Janesville, Wis.  
 Howe & Bassett Co., Inc., 840 University Ave., Rochester, N. Y.  
 Howe Ice Machine Co., 2825 Montrose Ave., Chicago.  
 Howell Electric Motors Co., Howell, Mich.  
 Howes-Woods Co., 511 Medford St., Charlestown Dist., Boston.  
 Hub Specialty Co., Governor Winthrop Rd., Somerville, Mass.  
 Hubbard Co., 1014 Marquette Ave., Minneapolis, Minn.  
 Hubbell Corp., 1315 W. Carroll Ave., Chicago.  
 Hudson, H. A., P. O. Box 121 Hertel Sta., Buffalo, N. Y.  
 Hueller Mfg. Co., Inc., H. J., 559 Rogers Ave., Brooklyn, N. Y.  
 Hugo Mfg. Co., 49th Ave., W. & Superior St., Duluth, Minn.  
 Hunt & Son, C. B., Box 300, Salem, Ohio.  
 Hunter Fan & Ventilating Co., Sterick Bldg., Memphis, Tenn.  
 ● Hussey & Co., C. G., 2850 Second Ave., Pittsburgh, Pa.  
 Huwer Heating Corp., 2375 West Fort St., Detroit.  
 Huyette Co., Inc., Paul B., Philadelphia.  
 Hyatt Bearings Division, General Motors Sales Corp., Harrison, N. J.

Ice Cooling Appliance Corp., Morrison, Ill.  
 Ideal Commutator Dresser Co., 1084 Park Ave., Sycamore, Ill.  
 Ideal Electric & Mfg. Co., E. First & Oak Sts., Mansfield, O.  
 Ideal Furnace Co., 2995 E. Grand Blvd., Detroit, Mich.  
 Ideal Heating Corp., 897 East Gage Ave., Los Angeles, Cal.  
 ● Ilg Electric Ventilating Co., 2850 N. Crawford Ave., Chicago, Ill.  
 Illinois Iron & Bolt Co., 918 S. Michigan Ave., Chicago, Ill.  
 ● Illinois Testing Laboratories, Inc., 412 N. LaSalle St., Chicago, Ill.  
 Illinois Zinc Co., Peru, Ill.  
 Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago, Ill.  
 Imperial Electric Co., Ira Ave., Akron, O.  
 Imperial Molded Products Corp., 2925 W. Harrison St., Chicago.  
 Independence Stove & Furnace Co., Cor. Hayward & Cottage, Independence, Mo.  
 Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill.  
 ● Independent Register Co., 3747 E. 93rd St., Cleveland, O.  
 Indian Trailer Corporation, Koolroom Div., 2338 Indiana Ave., Chicago, Ill.  
 Industrial Engineering Corporation, Terre Haute, Ind.  
 Industrial Mfg. & Engineering Co., 3845 N. Ravenswood Ave., Chicago.

Industrial Research, Lansdowne, Pa.  
 Industrial Sheet Metal Works, Inc., 628 E. Forest Ave., Detroit.  
 Ingersoll-Rand Co., 11 Broadway, New York City.  
 Ingersoll Steel & Disc Div., Borg-Warner Corp., 310 S. Michigan Ave., Chicago, Ill.  
 Inland Steel Co., 38 S. Dearborn St., Chicago, Ill.  
 Insto-Gas Corporation, 1900 E. Jefferson, Detroit.  
 Insul-Wool Insulation Corp., Wichita, Kansas.  
 Insulite Div. Minnesota and Ontario Paper Co., 1100 Builders Exchange Building, Minneapolis.  
 Inter-Coastal Paint Co., 15th & Southern R. R., East St. Louis, Ill.  
 International Engineering, Inc., 1145 Bolander, Dayton, O.  
 International Engineering Wks., Inc., Framingham, Mass.  
 International Heater Co., 101 Park Ave., Utica, N. Y.  
 International Moistening Co., 489 S. Main St., Providence, R. I.  
 International Nickel Co., Inc., 67 Wall St., New York City.  
 International Register Co., 15 S. Throop St., Chicago.  
 International Steel Co., 1556 Edgar St., Evansville, Ind.  
 International Vermiculite Co., 11th & Stanford Ave., Springfield, Ill.  
 ● Interstate Machinery Co., Inc., 1433 W. Pershing Road, Chicago.  
 Interstate Metal Products Company, Inc., 4401 Ogden Ave., Chicago.  
 Iona Ventilator Co., Inc., 2821-29 W. Dauphin St., Philadelphia, Pa.  
 Iowa Foundry Co., W. 2nd & Cook, Sioux City, Ia.  
 Iowa Paint Mfg. Co., 118-20 Eighth St., Des Moines, Ia.  
 Iron Fireman Mfg. Co., 3170 W. 106th St., Cleveland, O.  
 Iwan Brothers, 1503 Prairie Ave., South Bend, Ind.

## J

Jackson-Bangor Slate Co., Pen Argyl, Pa.  
 Jackson Sheet Metal Works, 3012 Washington Ave., Ogden, Utah.  
 Jacobs Co., B. & J., 1725 Johns St., Cincinnati, O.  
 Jacobson Machine Works, Inc., A. E., 1090 Tenth Ave., S. E., Minneapolis, Minn.  
 Jaden Mfg. Co., Inc., F., 1601 W. 2nd St., Hastings, Nebr.  
 Jamar Co., Walker, 367 S. First Ave., E., Duluth, Minn.  
 James Regulator Co., Inc., Peacock St., Pottsville, Pa.  
 Jamestown Metal Corp., Jamestown, N. Y.  
 Jamieson Mfg. Co., 2608 Swiss Ave., Dallas, Texas.  
 Janette Mfg. Co., 556 W. Monroe St., Chicago, Ill.  
 Jefferson Electric Co., 25th & Madison St., Bellwood, Ill.  
 Jefferson Machine Tool Co., Fourth, Cutter & Sweeney Sts., Cincinnati, Ohio.  
 Jelliff Mfg. Corp., C. O., Southport, Conn.  
 Jessop Steel Co., Lock Box 489, Washington, Pa.  
 Jewel Mfg. Co., 1874 Highland Parkway, St. Paul.  
 Jewett Stove & Foundry Corp., Military Rd., Buffalo, N. Y.  
 Jiffy Manufacturing Co., Hillside, N. J.  
 Joal Mfg. Corp., 2058 Canton St., Toledo.  
 Johns-Manville, 22 E. 40th St., New York City.  
 Johnson Bronze Co., S. Mill St., New Castle, Pa.  
 Johnson Co., Lloyd S., 2241 Indiana Ave., Chicago.  
 Johnson Co., S. T., 940 Arlington Ave., Oakland, Cal., and 401 N. Broad St., Philadelphia, Pa.  
 Johnson Fan & Blower Corp., 1319 W. Lake St., Chicago, Ill.  
 ● Johnson Gas Appliance Co., 520 "E" Ave., N. W., Cedar Rapids, Ia.  
 Johnson, Inc., William, Brenner & Kent Sts., Newark, N. J.  
 ● Johnson Ladder & Shoe Co., Eau Claire, Wisconsin.  
 Johnson Mfg. Co. Tenth & Sycamore, Waterloo, Ia.  
 Johnson Service Co., 507 E. Michigan St., Milwaukee, Wis.  
 Johnston & Chapman Co., 2925 Carroll Ave., Chicago, Ill.  
 Johnston Co., Wm. W., 115 Bayard St., Dayton, O.  
 Johnston Gas Furnace Corp., 11847 Vose St., North Hollywood, Cal.  
 Johnston Tin Foil & Metal Co., 6100 S. Broadway, St. Louis.  
 Joliet Heating Corp., 1403 Herkimer St., Joliet, Ill.  
 Jones & Laughlin Steel Corp., Third Ave. & Ross St., Pittsburgh, Pa.  
 Jones Foundry & Machine Co., W. A., 4401 W. Roosevelt Rd., Chicago, Ill.  
 Jones Products Corporation, Ferndale, Mich.  
 Jordan & Co., Paul R., 631 S. Delaware St., Indianapolis, Ind.  
 Juniper Elbow Company, Inc., 72-15 Metropolitan Ave., Middle Village, N. Y.

## K

Kals Sunrise Works, 5659 Linwood Ave., Detroit, Mich.  
 Kaiser Co., H. S., 3336 Franklin Blvd., Chicago.  
 Kane Mfg. Corporation, Lock Box 81, Kane, Pa.  
 Katelman Foundry & Mfg. Co., Council Bluffs, Iowa.  
 Kauffman Air Conditioning Corp., 4336 W. Pine St., St. Louis, Mo.  
 Kaustine Co., Inc., Perry, N. Y.  
 Kawneer Co., Niles, Mich.  
 Kaybar Burner Corp., 4545 Cottage Grove Ave., Chicago, Ill.  
 Keasbey Co., Robert A., 139 W. 19th St., New York City.  
 Keasbey & Mattison Co., Butler Ave., Ambler, Pa.  
 Keith Furnace Co., Dean Ave. at E. 26th, Des Moines, Ia.  
 Keldur Corp., 420 Lexington Ave., New York City.

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Keller, Inc., Wm. H., Grand Haven, Mich.  
 Kelley Manufacturing Co., P. O. Box 17, Houston, Texas.  
 Kelsey Heating Co., Inc., 277 James St., Syracuse, N. Y.  
 Kelvinator Division, Nash-Kelvinator Corp., 14250 Plymouth Rd., Detroit.  
 Kelvin-White Co., 90 State St., Boston.  
 Kennard, Inc., Sam, 3331-3339 Market St., St. Louis.  
 Kennedy, Inc., David E., 60 Second Ave., Brooklyn, N. Y.  
 Kent Co., Inc., 167 Canal St., Rome, N. Y.  
 Kent Co., Inc., J. King, 6477 Manchester Ave., St. Louis.  
 Kerentoff, G. L., 2803 Jefferson Ave., Cincinnati.  
 Kernchen Co., 333 N. Michigan Ave., Chicago, Ill.  
 Kester Solder Co., 4201 Wrightwood Ave., Chicago, Ill.  
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 Keystone Asphalt Products Co., 43 E. Ohio St., Chicago.  
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 Kimberly-Clark Corp., 8 S. Michigan Ave., Chicago.  
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 King Ventilating Co., Box 178, Owatonna, Minn.  
 Kingston Products Corporation, 1415 N. Webster, Kokomo, Ind.  
 Kinnear Mfg. Co., P. O. Box 598, Columbus, O.  
 Kirk & Blum Mfg. Co., 2820 Spring Grove Ave., Cincinnati, O.  
 Kitson Co., 1500 Walnut St., Philadelphia, Pa.  
 Klauer Mfg. Co., 9th & Washington St., Dubuque, Ia.  
 Kleenaire Corp., 409 Jefferson St., Stevens Point, Wis.  
 Kleen-Heat, Inc., 1823 Carroll Ave., Chicago, Ill.  
 Klein Stove Co., Trenton Ave. & Tloga St., Philadelphia, Pa.  
 Klenk's Aviation Snips, 107 E. 5th St., Wilmington, Del.  
 Kluegel & Co., E., 187 W. Kellogg Blvd., St. Paul, Minn.  
 Knickerbocker Co., Jackson, Mich.  
 Knowles Air Conditioning, 1324 Marshall St., N. E., Minneapolis.  
 Knowles Mushroom Ventilator Co., 11 Label St., Montclair, N. J.  
 Kol-Master Corp., Oregon, Ill.  
 Koons Furnace Co., 219 W. Van Buren, Danville, Ill.  
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 Korth Oil Burner Corp., 123 Hawthorne St., Roselle Park, N. J.  
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 Kraker, Henry, 54 W. 14th St., Holland, Mich.  
 Kramer Trenton Co., 626 Brunswick Ave., Trenton, N. J.  
 Krehbiel Co., J. H., 425 N. Crawford Ave., Chicago, Ill.  
 Kruse Company, 353 W. 16th Pl., Indianapolis, Ind.  
 Kruse & Dewenter Co., 427-429 E. Washington St., Indianapolis, Ind.

## L

Laclede-Christy Clay Products Co., 411 N. Seventh St., St. Louis, Mo.  
 Laclede Steel Co., Arcade Bldg., St. Louis, Mo.  
 Laco Oil Burner Co., 238 Union St., Griswold, Ia.  
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 Ladon Co., 902 S. Wabash Ave., Chicago.  
 Lamb & Ritchie Co., 250 Albany St., Cambridge, Mass.  
 •Lamneck Products, Inc., Cremona Ave., Middletown, Ohio.  
 Lamson & Sessions Co., 1971 W. 85th St., Cleveland.  
 Landwehr Heating Corp., 6th & Cayuga Sts., Philadelphia.  
 Langsenkamp Co., F. H., 229 E. South St., Indianapolis, Ind.  
 Larkin Colls, Inc., 519 Fair St., S. E., Atlanta, Ga.  
 Lastik Products Co., Inc., 604 American Bank Bldg., Pittsburgh, Pa.  
 •Lau Blower Co., 2005 Home Ave., Dayton, O.  
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 Leahy Manufacturing Co., 1804 E. 8th St., Los Angeles.  
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 Ledkote Products Co., 35-01 Vernon Blvd., Long Island City, N. Y.  
 Lee Furnace Co., 308 E. LaSalle, South Bend, Ind.  
 Lee Co., K. O., P. O. Box 35, Aberdeen, S. D.  
 Lee & Son, Thomas, 128-132 W. Second St., Cincinnati, O.  
 Leeds & Northrup Co., 4953 Stenton Ave., Philadelphia, Pa.  
 Lees, John, Div., Serrick Corp., Muncie, Ind.  
 Leeson Air Conditioning Corporation, 14631 Meyers Rd., Detroit, Mich.  
 Leffel & Co., James, 426 East St., Springfield, O.  
 Lehigh Fan & Blower Co., Front & Linden Sts., Allentown, Pa.  
 Lehon Company, 4411 Oakley Ave., Chicago.  
 Leland Electric Co., Inc., 1501 Webster St., Dayton, O.  
 Lenk Mfg. Company, Newton Lower Falls, Mass.  
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 1705 Olentangy River Rd., Columbus, Ohio; 400 N. Midler Ave., Syracuse, N. Y.  
 Leslie Welding Co., 2943 Carroll Ave., Chicago.  
 •Levow, David, 308 W. 20th St., New York City.  
 Levy Bros. Company, 2334-2246 E. 38th St., Los Angeles.  
 Lewellen Mfg. Co., Columbus, Ind.  
 Lewin-Mathes Company, Lewin Metals Div., Mississippi Ave. & A. & S. Tracks, East St. Louis, Ill.  
 Lewis & Co., Inc., Chas. S., 2207 Pine St., St. Louis, Mo.  
 Libbey-Owens-Ford Glass Co., Box 919, Toledo, O.

•Libert Machine Co., 324 N. Roosevelt St., Green Bay, Wis.  
 Lincoln Electric Co., 12818 Colt Rd., Cleveland, O.  
 Linde Air Products Co., The, 30 E. 42nd St., New York City.  
 Lindermere Machine & Tool Co., Inc., 12233 Coyle Ave., Detroit.  
 Linear Packing & Rubber Co., Inc., State Read & Levick St., Philadelphia.  
 Link-Belt Co., Stoker Div., 2410 W. 18th St., Chicago, Ill.  
 Lion Mfg. Corp., 2640 W. Belmont Ave., Chicago.  
 Liquefied Gas Appliance Co., Mars, Pa.  
 Lissberger & Son, Inc., Marks, 23-01 Borden Ave., Long Island City, N. Y.  
 Lite-Cast Corp., State Rd. & Bleigh St., Philadelphia.  
 •Little Burner Co., Inc., H. C., 2nd & Lincoln, San Rafael, Cal.  
 Little Giant Vaporizer Co., 5101 Classen Blvd., Oklahoma City, Okla.  
 Little Janitor Furnace Clock Co., 621 Broadway, New York City.  
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 Livingston Repair, South Fountain St., Marshall, Mich.  
 Lochinvar Products Division of Michigan Tank & Furnace Corp., 14247 Tireman Ave., Dearborn, Mich.  
 •Lockformer Co., 4615 Arthington St., Chicago, Ill.  
 Lockjoint Wood Products Co., 1721 Mildred St., Wichita, Kan.  
 Logan-Long Co., 37 W. Van Buren St., Chicago, Ill.  
 Lohman, Inc., William J., 1206 S. Grove St., Irvington, N. J.  
 Loneran Manufacturing Co., Albion, Mich.  
 Lookout Boiler & Mfg. Co., Chattanooga, Tenn.  
 Lord Mfg. Co., 1641 W. 12th St., Erie, Pa.  
 Lovejoy Flexible Coupling Co., 5001 W. Lake St., Chicago.  
 Lowell Air Conditioning Corp., Otis Building, Philadelphia.  
 Lucas & Company, Inc., John, 322 Race St., Philadelphia.  
 Lucius, Wm. I., 522 W. 45th St., New York City.  
 Ludowici-Celadon Co., 104 S. Michigan Ave., Chicago.  
 Lukens Metal Co., Thos. F., Hedley & Bath Sts., Philadelphia.  
 Lukens Steel Co., 308 S. First Ave., Coatesville, Pa.  
 Lusto Coated Sheets Co., 1220 Ridge Ave., Pittsburgh, Pa.  
 Lyman Co., H. B., Southampton, Mass.  
 Lyon Conklin & Co., Inc., Race & McComas St., Baltimore.

## M

Maas & Waldstein Co., 438 Riverside Ave., Newark, N. J.  
 McClure Builders' Supply Co., 68 E. Clark St., East Palestine, O.  
 McCord Radiator & Mfg. Co., 2587 E. Grand Blvd., Detroit.  
 McCorkle Co., D. H., Sixth & Bancroft Way, Berkeley, Cal.  
 •McDonnell & Miller, 400 N. Michigan Ave., Chicago, Ill.  
 McKay Co., York, Pa.  
 •McLeod & Henry Co., Inc., 395A First St., Troy, N. Y.  
 McLouth Air Conditioning Corporation, 2400 E. Michigan Ave., Lansing, Mich.  
 McNamee Products, 370 Hazel Ave., Glencoe, Ill.  
 McPherson Furnace & Supply Co., 1805 N. E. 2nd Ave., Portland, Ore.  
 McQuay, Inc., 1600 Broadway, N. E., Minneapolis, Minn.  
 MaGirl Foundry & Furnace Works, P. H., 401-413 E. Oakland Ave., Bloomington, Ill.  
 Magnet Switch Co., 340 W. Huron St., Chicago.  
 Mahan Oil Burner & Furnace Co., Lake & Church, Elmhurst, Ill.  
 Mahon Co., R. C., 8650 Mt. Elliott Ave., Detroit, Mich.  
 •Maid-O'-Mist, Inc., 215 N. Aberdeen St., Chicago, Ill.  
 Main Cornice Works, 1416 N. Main St., Los Angeles.  
 Majestic Co., 733 Erie St., Huntington, Ind.  
 Majestic Flashing Company, Reisterstown Rd. at Elgin Ave., Baltimore.  
 Majestic Furnace Co., 1723 Westlake Ave. N., Seattle, Wash.  
 Malco Gear Co., 13904 Lincoln Ave., Dolton, Ill.  
 Mall Tool Company, 7740 South Chicago Ave., Chicago, Ill.  
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 Mallory Sales Co., 13904 Lincoln Ave., Dolton, Ill.  
 Manhattan Perforated Metal Co., Inc., 43-17 37th St., Long Island City, N. Y.  
 Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., 61 Willett St., Passaic, N. J.  
 Manheim Manufacturing and Belting Co., Manheim, Pa.  
 Manley Products Corp., State & Hay Sts., York, Pa.  
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 Marblehead Lime Co., 160 N. LaSalle St., Chicago.  
 Marble-Card Electric Co., Gladstone, Mich.  
 Marion Furnace Co., 1441 Brooklyn Ave., Detroit.  
 Marion Machine, Foundry & Supply Co., P. O. Box 685 Marion, Ind.  
 •Marley Co., 3001 Fairfax Rd., Kansas City, Kan.  
 Marlin-Rockwell, Jamestown, N. Y.  
 Marlo Coil Company, 6135 Manchester Ave., St. Louis.

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Marquette Mfg. Co., Inc., 401-409 Johnson St., N. E., Minneapolis, Minn.  
 Marsh Corporation, Jas. P., 2073 Southport Ave., Chicago.  
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 Marshall Furnace Co., Marshall, Mich.  
 Marshallan Mfg. Co., 5716 Euclid Ave., Cleveland.  
 • Marshalltown Mfg. Co., 901 E. Nevada St., Marshalltown, Ia.  
 Martin, J. O., and C. U., 647 Minna St., San Francisco  
 Martin Metal Mfg. Co., 900 E. 2nd St., Wichita, Kan.  
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 Martocello & Co., Jos. A., 229 N. 13th St., Philadelphia, Pa.  
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 Mason & Sons, F. E., Batavia, N. Y.  
 Masonite Corp., 111 W. Washington St., Chicago, Ill.  
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 Matthews & Co., J. H., 480 Canal St., New York City.  
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 Mauer Engineering, 2525 Colfax St., Evanston, Ill.  
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 • May-Flebeiger Co., S. 21st St., Newark, O.  
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 Mayflower Oil Burner Corp., 5002 Hudson Blvd., West New York, N. J.  
 May Oil Burner Corp., Maryland Ave. & Oliver St., Baltimore, Md.  
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 • Mercoid Corp., 4201 Belmont Ave., Chicago, Ill.  
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 Meriam Co., 1955 W. 112th St., Cleveland.  
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 Mesker & Co., Geo. L., 400 N. W. First St., Evansville, Ind.  
 Metal Door & Trim Co., La Porte, Ind.  
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 Metal & Thermit Corp., 120 Broadway, New York City.  
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 • Meyer & Bro. Co., F., 1313 S. Adams St., Peoria, Ill.  
 • Meyer Furnace Co., 1300 S. Washington St. Peoria, Ill.  
 Meyer Mfg. Co., 2536 Fourteenth St., Detroit.  
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 • Michigan Tank & Furnace Corp., 14101 Prairie Ave., Detroit, Mich.  
 Micro Products Co., 20 N. Wacker Dr., Chicago.  
 Micro-Westco, Inc., Bettendorf, Ia.  
 Middleton Mfg. & Sales Co., 125 N. First St., Minneapolis.  
 Midwest Aluminum Products, Inc., 123 E. Pittsburgh Ave., Milwaukee, Wis.  
 Midwestern Supply Co., 314 Stanley Terrace, Chicago.  
 Milburn Co., Alexander, 1426 W. Baltimore St., Baltimore.  
 • Milcor Steel Co., 4117 W. Burnham St., Milwaukee, Wis.  
 Miller Co., Meridan, Conn.  
 Miller-Connell Mfg. Co., Inc., 222 W. North Bank Dr., Chicago.  
 Miller & Doing, Inc., 58 York St., Brooklyn, N. Y.  
 Miller & Son, C. Arthur, 202-204 S. Main St., Elmira, N. Y.  
 Miller Electric Mfg Co., Inc., 905 N. Meade St., Appleton, Wis.  
 Miller Floor Furnace Co., 741 E. 14th St., Oakland, Cal.  
 Miller Range & Furnace Co., Wm., 810-812 Main St., Cincinnati, O.  
 Miller Rubber Co., Inc., 1247 S. High St., Akron, O.  
 Millers Falls Co., 57 Wells St., Greenfield, Mass.  
 Mill-Rose Co., 2498 E. 79th St., Cleveland, O.  
 Mills Novelty Co., 4110 W. Fullerton Ave., Chicago, Ill.  
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 Milwaukee Gas Specialty Company, 2025 W. Clybourn, Milwaukee.  
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 Misener Mfg. Co., Inc., 326 E. Washington St., Syracuse, N. Y.  
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 Mission Water Heater Co., 7101 McKinley Ave., Los Angeles.  
 Mitchell Moulding Co., 1501 Circle Ave., Forest Park, Ill.

Mitchell & Smith, Inc., 9469 Copeland Ave., Detroit.  
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 ModernAire Co. Div. Des Moines Stove Repair Co., 107 S. W. Second St., Des Moines, Iowa.  
 Modine Mfg. Co., 17th St., Racine, Wis.  
 Moeller Instrument Co., 132nd St. & 89th Ave., Richmond Hill, N. Y.  
 Mohler Co., J. K., The, 151 Church Ave., Ephrata, Pa.  
 Mojonner Brothers Co., 4601 W. Ohio St., Chicago.  
 Monarch Engineering Company, 500-600 Linden Ave., Dayton, Ohio.  
 Monarch Furnace Fittings Manufacturers, 2240 W. 49th St., Chicago, Ill.  
 Monarch Heating Co., 4661 Alger St., Los Angeles.  
 Monarch Mfg. Works, Inc., Salmon & Westmoreland Sts., Philadelphia, Pa.  
 Moncrief Furnace Co., P. O. Box 1673, Atlanta, Ga.  
 Moncrief Furnace & Manufacturing Co., Inc., 3903 Main St., Dallas, Texas.  
 Monitor Controller Co., 51 S. Gay St., Baltimore, Md.  
 • Monmouth Products Co., 1929-41 East 61st St., Cleveland, O.  
 Monogram Combustion Chamber Co., State Rd. & Bleigh St., Philadelphia.  
 Montag Stove & Furnace Works, 2011 N. Columbia Blvd., Portland, Ore.  
 Montgomery Brothers, 61 Fremont St., San Francisco, Cal.  
 Moore Corp., Benton St., Joliet, Ill.  
 Moore Steam Turbine Div., Worthington Pump & Machinery Corp., Wellsville, N. Y.  
 Moran Flexible Steam Joint Co., 217 W. Main St., Louisville, Ky.  
 Morey, Dan, 816 S. Robertson Blvd., Los Angeles.  
 Morris Machine Works, 31 E. Genesee St., Baldwinsville, N. Y.  
 Morrison Products, Inc., 16816 Waterloo Rd., Cleveland.  
 • Morrison Steel Products, Inc., 601 Amherst St., Buffalo, N. Y.  
 Morse Chain Co., Ithaca, N. Y.  
 Mortell Co., J. W., Hobbie Ave & Big Four R. R., Kankakee, Ill.  
 Motex Metal Process Corporation, 4473-4475 W. Jefferson Ave., Detroit.  
 Motorstoker Div. Hershey Machine & Foundry Co., Manheim, Pa.  
 Mountain States Equipment Co., 1238 Speer Blvd., Denver, Colo.  
 Mt. Vernon Furnace & Mfg. Co., P. O. Box 213, Mt. Vernon, Ill.  
 Mueller Brass Co., Lapeer Ave., Port Huron, Mich.  
 Mueller Co., Decatur, Ill.  
 • Mueller Furnace Co., L. J., 2005 W. Oklahoma Ave., Milwaukee, Wis.  
 Mullins Mfg. Corp., Warren, O.  
 Multi-Cell Sales Corp., 3420 Nicollet Ave., Minneapolis.  
 Muncie Gear Works, Inc., 700 N. Wysox, Muncie, Ind.  
 Mundt Cork Corp., 65 S. 11th St., Brooklyn, N. Y.  
 Mundt & Sons, Charles, 53 Fairmount Ave., Jersey City, N. J.  
 Munn and Steele, Inc., 130 Lister Ave., Newark, N. J.  
 Murray Co., Dallas, Tex.  
 Murray Corporation of America, 7700 Russell St., Detroit.  
 Murray Manufacturing Co., D. J., 1002-24 Third St., Wausau, Wis.  
 Murray Tile Co., Cloverport, Ky.  
 Myers & Bro. Co., The F. E., Ashland, O.  
 Myers Electric Co., 410 Third Ave., Pittsburgh, Pa.  
 Myers Ladder Equipment Co., 3121 Buena Vista, Madison, Wis.

## N

Nash Engineering Co., Wilson Ave., South Norwalk, Conn.  
 Nash Refrigeration Co., Inc., Summit, New & Bleecker Sts., Newark, N. J.  
 National Airoil Burner Co., Inc., 1284 E. Sedgley Ave., Philadelphia.  
 National Brass & Copper Co., Inc., P. O. Box 365, Lisbon, Ohio.  
 National Cylinder Gas Co., 205 W. Wacker Dr., Chicago.  
 National Engineering Products, Inc., Commerce & Savings Bldg., Washington, D. C.  
 National Fireproofing Corp., 202 E. Ohio St., N. S., Pittsburgh, Pa.  
 National Foundry & Furnace Co., Station "B," Dayton, O.  
 National Gypsum Co., Delaware Ave., Buffalo, N. Y.  
 National Iron Works, Foot of 7 Ave., San Diego, Cal.  
 National Lead Co., 111 Broadway, New York City.  
 National Lock Co., Inc., Rockford, Ill.  
 National Machine Tool Co., 1536 Clark St., Racine, Wis.  
 National Machine Works, 122 S. Michigan Ave., Chicago, Ill.  
 National Mfg. Corp., 151 Fillmore Ave., Tonawanda, N. Y.  
 National Manufacturing & Engineering Co., 1441 Brooklyn Bldg., Detroit.  
 National Safety Device Co., 836 W. Hubbard St., Chicago.  
 National Screw & Mfg. Co., 2440 E. 75th St., Cleveland, O.  
 National Sheet Metal Co., 1617-1629 Water St., Peru, Ill.  
 National Stainless Clip Corporation, 51 Chambers St., New York City.  
 National Steam Pump Co., 701 W. Johnson St., Upper Sandusky, O.

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National Stoker Factory Sales Co., 2737 Washington Ave., St. Louis.

●National Super Service Co., 1944 N. 13th St., Toledo, O.

National Time & Signal Corp., 600 E. Milwaukee Ave., Detroit.

Nebel Manufacturing Co., P. O. Box 3942, Shaker Sq. Station, Cleveland.

Neemes Foundry, Inc., 286 First St., Troy, N. Y.

Nelson Chemical Co., Bellevue & Benson Sts., Detroit.

Nelson Co., 2604 4th Ave., Detroit, Mich.

Nelson Mfg. Co., E. F., Cor. Main & Marshall Sts., N. E., Minneapolis, Minn.

Nesbitt, Inc., John J., State Rd. & Rhawn St., Philadelphia.

Nevinger Mfg. Co., Greenfield, Ill.

New-Aire Blower Co., 23768 Michigan Ave., Dearborn, Mich.

New Albany Machine Mfg. Co., E. 10th & Water Sts., New Albany, Ind.

New Delphos Mfg. Co., 102-124 S. Pierce St., Delphos, O.

New Departure, Div. General Motors Sales Corp., Bristol, Conn.

New Haven Copper Co., Seymour, Conn.

New Jersey Zinc Co., 160 Front St., New York City.

Newman Brothers, Inc., 662-670 W. 4th St., Cincinnati, Ohio.

New Mission Htg. & Vent. Co., 3401 Mission St., San Francisco.

New Monarch Machine & Stamping Co., 406 S. W. 9th St., Des Moines, Ia.

Newport Rolling Mill Co., Div. Andrews Steel Co., 9th & Lowell Sts. Newport, Ky.

New Way Products Company, 955 Spitzer Bldg., Toledo.

New York Blower Co., 3155 Shields Ave., Chicago, Ill.

Niagara Blower Co., 6 E. 45th St., New York City.

●Niagara Machine & Tool Works, 637-697 Northland Ave., Buffalo, N. Y.

Nice Ball Bearing Co., 30th & Nicetown Lane, Philadelphia.

Nicholson & Co., W. H., 12 Oregon St., Wilkes-Barre, Pa.

Nielco Chemical Co., 6564 Benson St., Detroit.

Niles Rolling Mill Co., Niles, O.

Niles Steel Products Division, Republic Steel Corp., 465 Walnut St., Niles, Ohio.

●Norge Heating & Conditioning Div., Borg-Warner Corp., 670 E. Woodbridge St., Detroit, Mich.

Norma-Hoffman Bearings Corp., Stanford, Conn.

Norman Sheet Metal Mfg. Co., W. F., 212-236 N. Cedar St., Nevada, Mo.

Norristown Magnesia & Asbestos Co., Washington St., Below Ford St., Norristown, Pa.

North American Fibre Products Co., Keith Building, Cleveland, Ohio.

North Bangor Slate Co., Bangor, Pa.

Northern Blower Co., 6409 Barberton Ave., Cleveland, O.

Northern Furnace & Supply Co., 25th St. & 2nd Avenue North, Billings, Mont.

Northern Steel & Stoker Corp., 3100 Prospect Rd., Peoria, Ill.

Northern Weatherstrip Co., 367 S. 1st Ave., E., Duluth, Minn.

Northwest Lead Company, 2700 16th Ave., S. W., Seattle, Wash.

Northwest Stove & Furnace Works, 2345 S. E. Gladstone St., Portland, Ore.

●Northwestern Stove Repair Co., 662 W. Roosevelt Rd., Chicago, Ill.

Nortmann-Duffke Co., 2740 S. 32nd St., Milwaukee, Wis.

Norwin Co., East Alburn St., Freeport, Ill.

Norwood Filtration Co., N. Maple St., Florence, Mass.

Nugent Furnaces, Thos., 223 E. 80th St., New York City.

NuSteel Company, 1714 S. Ashland Ave., Chicago.

Nu-Way Corp., The, 2416 Fourth Ave., Rock Island, Ill.



Oakland Foundry Co., Avenue A & L & N Tracks, Belleville, Ill.

O'Brien Varnish Co., 101 N. Johnson St., South Bend, Ind.

Ohio Brass Co., N. Main St., Mansfield, Ohio.

Ohio Electric Mfg. Co., 5910 Maurice Ave., Cleveland, O.

Ohio Foundry and Manufacturing Co., Steubenville, O.

●Ohio Products Co., 16507 Lucille Ave., Cleveland, O.

Ohio Wire Products Co., 217 N. Tusc. Ave., Dover, Ohio.

Ohl & Co., Geo. A., 151-161 Oraton St., Newark, N. J.

Ohmlac Paint & Refining Co., 6550 S. Central Ave., Chicago.

O'Keefe & Merritt Co., 3700 E. Olympic Blvd., Los Angeles.

●Olsen Manufacturing Co., The C. A., Elyria, O.

Omaha Stove Repair Works, 1206 Douglas St., Omaha, Nebr.

O'Neill-Irwin Manufacturing Co., 316 Eighth Ave., S., Minneapolis.

Orbon Stove Co., L. & N. and Sycamore St., Belleville, Ill.

Original Metal Forming Machine Co., 952 Twentieth Ave., Seattle, Wash.

Ormsby-Osterman Company, 3631 Cass Ave., St. Louis.

●Osborn Co., J. M. & L. A., 1541 E. 38th St., Cleveland, O.

Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.

Otis Steel Co., 3341 Jennings Rd., Cleveland, O.

OverSpred Stoker Co., Fulton, Jackson & Jefferson Sts., Ottawa, Ill.

Owen-Dyneto Div. USL Battery Corp., Syracuse, N. Y.

Owens-Corning Fiberglass Corp., Nicholas Bldg., Toledo, O.

Ozone Air Company, 923 Cherry St., S. E., Grand Rapids, Mich.

Ozo-Ray Process Corp., 400 N. Sangamon St., Chicago.

## P

Pacific Gas Heating Co., 245 Van Ness Ave., South, San Francisco.

●Pacific Gas Radiator Co., Roseberry and Walter Sts., Huntington Park, Cal.

Pacific Lumber Co., 100 Bush St., San Francisco, Cal.

Pacific Pump Works, 5716 Bickett St., Huntington Park, Calif.

Pacific States Felt & Mfg. Co., Inc., 845 Howard St., San Francisco.

Packham Crimper Co., Oak St. & N. Y. C. Depot, Mechanicsburg, O.

Packless Metal Products Corp., New Rochelle, N. Y.

Page Steel & Wire Div. of American Chain & Cable Co., Inc., Monessen, Pa.

Paine Company, 2951 W. Carroll Ave., Chicago.

Paint-Point Corporation, 275 Passaic St., Newark, N. J.

Palmer Co., 2501 Norwood Ave., Norwood, Cincinnati, O.

Palmer Electric Co., 20 Sproat St., Detroit, Mich.

Palmer Mfg. Co., 3890 E. 91st St., Cleveland.

Palmer Manufacturing Corp., Phoenix, Ariz.

Pan-American Engineering Company, 820 Parker St., Berkeley, Cal.

Pangborn Corp., Pangborn Blvd., Hagerstown, Md.

Paragon Electric Co., 37 W. Van Buren St., Chicago, Ill.

Paragon Oil Burner Corp., 75 Bridgewater St., Brooklyn, N. Y.

Paramount Products Co., 545 Fifth Ave., New York City.

Park City Cornice Works, Inc., 56 McKinley Ave., Bridgeport, Conn.

Parker Appliance Co., 17325 Euclid Ave., Cleveland.

Parker Heating & Manufacturing Co., 1627 Third Ave., S., St. Petersburg, Fla.

●Parker-Kalon Corp., 190-192 Varick St., New York City.

Parker Rust-Proof Co., 2169 E. Milwaukee Ave., Detroit.

Parkersburg Iron & Steel Co., Parkersburg, W. Va.

Parks-Cramer Co., 970 Main St., Fitchburg, Mass.

●Patent Novelty Co., 312 Eighth St., Fulton, Ill.

●Patten Co., J. V., 200 DeKalb Ave., Sycamore, Ill.

Patterson Foundry & Machine Co., East Liverpool, O.

Patterson-Sargent Co., St. Clair, Kopp & 38th St., Cleveland.

Patterson Shade Co., 1525 N. Meridian St., Indianapolis, Ind.

●Payne Furnace & Supply Co., 336 N. Foothill Rd., Beverly Hills, Cal.

Peabody Engineering Corp., 580 Fifth Ave., New York City.

Peacard Co., M. A., 195 Dudley St., Boston.

Peck, Stow & Wilcox Co., Center St., Southington, Conn.

Pecora Paint Co., 4th St. & Erie Ave., Philadelphia, Pa.

Peerless Electric Co., 2000 W. Market St., Warren, O.

●Peerless Foundry Co., 1853 Ludlow Ave., Indianapolis, Ind.

Peerless Mfg. Corp., 1400 W. Ormsby St., Louisville, Ky.

Peerless of America, Inc., 515 W. 35th St., Chicago, Ill.

Peerless Oil Burner Co., Inc., 3926 Main St., Kansas City, Mo.

Peerless Pump Div., Food Machinery Co., 301 West Avenue 26, Los Angeles, Cal.

Penclasharp Awl & Tool Co. 1423-25 E. Illinois St., Evansville, Ind.

Peninsular Stove Co., 2699 Gratiot Ave., Detroit, Mich.

Penn Boiler & Burner Mfg. Corp., P. O. Box 753, Lancaster, Pa.

●Penn Electric Switch Co., Box 556, Goshen, Ind.

Penn Tool Company, 2415 N. Howard St., Philadelphia.

Penn Ventilating Co., 3252 Goodman St., Philadelphia.

Pennsylvania Engineering Works, 526 S. Jefferson St., New Castle, Pa.

Pennsylvania Flexible Metallic Tubing Co., 72nd St. & Powers Lane, Philadelphia.

Pennsylvania Furnace & Iron Co., P. O. Box 269, Warren, Pa.

Pennsylvania Wire Glass Co., 1612 Market St., Philadelphia.

Pentecost & Craft Co., 429 Wabash Ave., Terre Haute, Ind.

Peoples Oil Burner Co., 466 W. Superior St., Chicago.

Perfection Grate & Stoker Co., 4 Fisk Ave., Springfield, Mass.

Perfection Stove Co., 7609 Platt Ave., Cleveland, O.

●Perfex Corp., 500 W. Oklahoma Pl., Milwaukee, Wis.

Perham Products, Inc., 133 N. Wacker Drive, Chicago.

Perkins Machine Co., 4 Perkins Ave., Warren, Mass.

Perkins Machine Gear Co., Springfield, Mass.

Perkins & Son, Inc., B. F., Chicopee St., Holyoke, Mass.

Perkinson & Brown, 412 N. Wolcott Ave., Chicago.

Permutit Co., 330 W. 42nd St., New York, N. Y.

Pernot & Rich, Inc., 2546 San Fernando Rd., Los Angeles.

Peterson "Freezem" Mfg. & Sales Co., 316 Southwest Blvd., Kansas City, Mo.

Petroleum Heat & Power Co., Stamford, Conn.

Pfanzstlehl Chemical Co., 104 Lakeview Ave., Waukegan, Ill.

Pfeifer, Wm., 416 Greenwich St., New York City.

Pfening Co., Fred D. 1075 W. 5th Ave., Columbus, O.

Phelps Dodge Copper Products Corp., British American Tube Div., 46 Wall St., New York City.

Phelps Mfg. Co., 801 Thomas St., Little Rock, Ark.

Pheoli Manufacturing Co., 5700 Roosevelt Rd., Chicago.

Philadelphia Gear Co., Erie Ave. & G St., Philadelphia.

Philadelphia Thermometer Co., 915 Filbert St., Philadelphia.

Philco Radio & Television Corp., Tioga and C Streets, Philadelphia.

Phillips Cooling Tower Co., Inc., 114 Liberty St., New York City.

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- Phillips Drill Co., 1537 W. Cortland St., Chicago.  
 Phoenix Ice Machine Co., 2711 Church St., Cleveland.  
 Phoenix Ventilator Co., Inc., 1665 63rd St., Brooklyn.  
 Platt Products Corporation, 1149 S. Pennsylvania Ave., Lansing, Mich.  
 Pier Equipment Mfg. Co., 1440 Milton St., Benton Harbor, Mich.  
 Pilley Brush Co., Fort Madison, Ia.  
 Pioneer Heat Regulator Division, Master Electric Co., 100 Davis Ave., Dayton, Ohio.  
 Pioneer Manufacturing Co., 714 Oakland N. E., Cedar Rapids, Ia.  
 Pioneer Roofing & Sheet Metal Co., 226 N. Main St., Muskogee, Okla.  
 Pioneer Water Heater Co., 3005 Andriba St., Los Angeles.  
 Pittsburgh Furnace Parts Co., 109 Federal St., Pittsburgh.  
 Pittsburgh Plate Glass Co., 2000 Grant Bldg., Pittsburgh.  
 Pittston Stove Co., P. O. Box 279, Pittston, Pa.  
 Plant Rubber & Asbestos Works, 537 Brannan St., San Francisco.  
 Plastergon Wall Board Co. Philadelphia Ave., Buffalo, N. Y.  
 Plastic Products Co., 6475 Georgia Ave., Detroit, Mich.  
 Pleasantaire Corp., 329 Tower Bldg., Washington, D. C.  
 Pilbrico Jointless Firebrick Co., 1800 Kingsbury St., Chicago, Ill.  
 Plymouth Cordage Co., Court St., North Plymouth, Mass.  
 (Anderson Products, Inc., Cambridge, Mass., National Sales Agents.)  
 Plymouth Industries Inc., 1932 Harrison Ave., Plymouth, Ind.  
 Pocahontas Fuel Company Incorporated, Stoker Div., 1190 E. 152nd St., Cleveland.  
 Poe Co., C. W., 2795 E. 83rd St., Cleveland.  
 Poe, Ralph W., 44 White Ct., Canton, Ill.  
 Polk Mfg. Co., 2021-23 Winnebago St., Madison Wis.  
 Pomona Pump Co., 206 E. Commercial St., Pomona, Cal.  
 Poole Foundry & Machine Co., 1700 Union Ave., Woodberry, Baltimore.  
 Portland Stove Fdry. Co., Portland, Me.  
 Potomac Mfg. Co., 316 S. 10th St., Philadelphia, Pa.  
 Power King Tool Corporation, P. O. Box 150, Warsaw, Ind.  
 Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.  
 Practical Instrument Co., 2717 N. Ashland Ave., Chicago, Ill.  
 Prat-Daniel Corporation, Port Chester, N. Y.  
 Precision Control Co., 899 Bryant St., San Francisco.  
 Precision Thermometer & Instrument Co., 1434 Brandywine St., Philadelphia, Pa.  
 Preferred Utilities Manufacturing Corp., 33 W. 60th St., New York City.  
 Premier Furnace Co., Box 150, Dowagiac, Mich.  
 Premier Metal Etching Co., 21-03 44th Ave., Long Island City.  
 Presstite Engineering Co., 3900 Chouteau St., St. Louis, Mo.  
 Pressure Oil Burners, Inc., 55 N. Broad St., York Pa.  
 Progressive Company, 20 E. Jackson Blvd., Chicago.  
 Propellair, Inc., 1345 Lagonda Ave., Springfield, O.  
 Pryne & Co., Inc., 1245 E. 33rd St. Los Angeles, Cal.  
 Puhl & Hepper Mfg. Co., Inc., 6400 W. Florissant Ave., St. Louis, Mo.  
 Pyott Foundry & Machine Co., 328 N. Sangamon St., Chicago, Ill.  
 Pyramid Metals Co., 1334 N. Wells St., Chicago.  
 Pyrolite Products Co., 1221-31 W. 74th St., Cleveland, O.
- Q**
- Quaker Mfg. Co., 223 W. Erie St., Chicago, Ill.  
 Quick Furnace & Supply Co., 210 Court St., Des Moines, Ia.  
 Quickwork-Whiting Div., Whiting Corporation, 157th & Halsted Sts., Harvey, Ill.  
 Quiet-Heat Mfg. Corp., 135 N. J. Railroad Ave., Newark, N. J.  
 Quigley Company, Inc., 56 W. 45th St., New York City.  
 Quimby Pump Co., Inc., 340 Thomas St., Newark, N. J.  
 Quincy Stove Manufacturing Co., 807 S. Front St., Quincy, Ill.
- R**
- R-S Products Corp., 4530 Germantown Ave., Philadelphia, Pa.  
 Racine Stoker Mfg. Co., 1014 Eighth St., Racine, Wis.  
 Racine Tool & Machine Co., Erskine & Cook Sts., Racine, Wis.  
 Radiation Furnace Corp., 230 Bond St., Benton Harbor, Mich.  
 Radiator Specialty Co., 1722 Dowd Rd., Charlotte, N. C.  
 Rafter Machine Co., 259 Stephen St., Belleville, N. J.  
 Ramey Mfg. Co., 243 N. 5th St., Columbus, O.  
 Ramtite Co., Div. S. Obermayer Co., 2563 W. 18th St., Chicago.  
 Ranco Inc., 601 W. Fifth Ave., Columbus, O.  
 Randall Graphite Products Corp., 609 W. Lake St., Chicago.  
 Ransome Concrete Machinery Co., Industrial Div., Dunellen, N. J.  
 Ravenna Furnace & Heating Co., Ravenna, O.  
 Rawplug Co., Inc., The, 93 Lafayette St., New York City.  
 Ray Oil Burner Co., 401-409 Bernal Ave., San Francisco, Cal.  
 Reed Unit-Fans, Inc., 811 St. Charles St., New Orleans, La.  
 Reeves Pulley Co., 1000 N. Wilson St., Columbus, Ind.  
 Reeves Steel & Mfg. Co., Dover, O.  
 Refractory & Insulation Corp., 120 Wall St., New York City.  
 Refrigeration Appliances, Inc., 923 W. Lake St., Chicago, Ill.  
 Refrigeration Economics Co., Inc., 1232 Second St. N. E., Canton, Ohio.  
 Rega Mfg. Co., 79 Mt. Hope Ave., Rochester, N. Y.  
 Register & Grille Mfg. Co., Inc., 70 Berry St., Brooklyn, N. Y.  
 Reichert Float & Mfg. Co., 2238 Smead Ave., Toledo, O.  
 Reif-Hexoll, Inc., 37 Carroll St., Buffalo N. Y.  
 Reilly Tar & Chemical Corp., 1615 Merchants Bank Bldg., Indianapolis, Ind.  
 Reiner & Campbell Co., Inc., 667 Norwood Terrace, Elizabeth, N. J.  
 Reliable Gas Products Co., 1024 Second Ave., W. S., Cedar Rapids, Ia.  
 Reliable Perforating Co., 2047 N. Wood St., Chicago, Ill.  
 Reliance Automatic Lighting Co., 1929 Mead St., Racine, Wis.  
 Reliance Electric & Engineering Co., 1088 Ivanhoe Rd., Cleveland, O.  
 Reliance Refrigeration Machine Co., 3401 N. Kedzie Ave., Chicago, Ill.  
 Rempe Co., 340 N. Sacramento Ave., Chicago, Ill.  
 Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O.  
 Republic Steel Corp., Republic Bldg., Cleveland, O.  
 Research Corp., 405 Lexington Ave., New York City.  
 Research Products Corporation, 1011 E. Washington Ave., Madison, Wis.  
 Retinning Manufacturing Co., 3021 Greenview Ave., Chicago.  
 Revere Copper and Brass Incorporated, 230 Park Ave., New York City.  
 Rex Clay Products Company, 14414 Dexter Blvd., Detroit.  
 Reynolds Electric Company, 2685 W. Congress St., Chicago.  
 Reynolds Manufacturing Co., 412 Prospect N. E., Grand Rapids, Mich.  
 Reynolds Manufacturing Co., Springfield, Mo.  
 Reynolds Metals Co., Inc., Federal Reserve Bank Bldg., Richmond, Va.  
 Reznor Mfg. Co., Lock Box 231, Mercer, Pa.  
 Rhodes, Inc., M. H., 30 Bartholomew Ave., Hartford, Conn.  
 Ribside Furnace Co., 119 1/2 Clinton St. Wausau, Wis.  
 Richards-Wilcox Mfg. Co., Third St., Aurora, Ill.  
 Richmond Fireproof Door Co., Richmond, Ind.  
 Richmond Radiator Co., Inc., Uniontown, Pa.  
 Riester & Thesmacher Co., 1526 W. 25th St., Cleveland.  
 Riley Stoker Corp., 9 Neponset St., Worcester, Mass.  
 Rising & Nelson Slate Co., West Pawlet, Vt.  
 Rival Strap Corporation, 308 W. 20th St., New York City.  
 Riverton Lime & Stone Co., Inc., Riverton, Va.  
 Roan Mfg. Co., 1220 Washington Ave., Racine, Wis.  
 Robbins & Myers, Inc., 1345 Lagonda Ave., Springfield, O.  
 Roberts-Gordon Appliance Corp., 137 Arthur St., Buffalo.  
 Roberts-Hamilton Co., 707-715 S. Third St., Minneapolis.  
 Roberts Tube Works, 2500 Military Ave., Detroit.  
 Robertson, F. L., 56 Rano St., Buffalo, N. Y.  
 Robertson Co., H. H., 2400 Farmers Bank Bldg. Pittsburgh.  
 Robinson Furnace Co., 213 W. Hubbard St., Chicago.  
 Robinson Insulation Co., P. O. Box 1419, Great Falls, Mont.  
 Rochester Lead Works, Inc., 380 Exchange St., Rochester, N. Y.  
 Rochester Mfg. Co., Brighton Station, Rochester, N. Y.  
 Rock Fleece Company, 115 Durango St., El Paso, Texas.  
 Rock Island Register Co., 2425 Fifth Ave., Rock Island, Ill.  
 Rock Island Stove Co., 200 Fourth St., Rock Island, Ill.  
 Rockford Brass Works, Rockford, Ill.  
 Rockwood Mfg. Co., 1801 English Ave., Indianapolis, Ind.  
 Rock Wool Products Co., Inc., P. O. Box 276, Wabash, Ind.  
 Roebling's Sons Co., John A., 640 S. Broad St., Trenton, N. J.  
 Roesch & Associates, Inc., 120 E. Washington St., Syracuse, N. Y.  
 Roessing Mfg. Co., 1616 Noble St., Sharpsburg Sta., Pittsburgh.  
 Roller Bearing Co. of America, Whitehead Rd., Trenton, N. J.  
 Rolyan Corp., 2241 Indiana Ave., Chicago.  
 Rome-Turney Radiator Co., Canal St., Rome, N. Y.  
 Roper Corp., Geo. D., Blackhawk Ave., Rockford, Ill.  
 Rosebraugh Co., W. W., 680 S. 17th St., Salem, Ore.  
 Rosedale Foundry & Machine Co., Columbus Ave., N. S., Pittsburgh, Pa.  
 Ross Sprinkler Co., 34 Roberts St., Pasadena, Cal.  
 Rotary Mfg. Co., 5718 Long Beach Ave., Los Angeles, Cal.  
 Roto-Beam Division, Peerless of America, Inc., 3300 S. Indiana Ave., Chicago.  
 Round Oak Co., Dowagiac, Mich.  
 Roxalln Flexible Lacquer Co., Inc., 800 Magnolia Ave., Elizabeth, N. J.  
 Royal Air Conditioning Equipment, 1024 Westminster Ave., Alhambra, Cal.  
 Royal-Apex Mfg. Corp., 62 Schenectady Ave., Brooklyn, N. Y.  
 Royal Ventilator Co., 415 Locust St., Philadelphia, Pa.  
 Royersford Foundry & Machine Co., 55 Main St., Royersford, Pa.  
 Ruberoid Co., The, 500 Fifth Ave., New York City.  
 Ruby Chemical Co., 74 McDowell St., Columbus, O.  
 Rudy Furnace Co., Dowagiac, Mich.

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Ruemelin Mfg. Co., 3860 N. Palmer St., Milwaukee, Wis.  
 Ruggles-Klingemann Mfg. Co., 4 Foster Ct., Salem, Mass.  
 Russell & Company, W. A., Bridgeport, Conn.  
 Russell Electric Co., 342 W. Huron St., Chicago, Ill.  
 Russell Co., F. C., 1836 Euclid Ave., Cleveland.  
 Russell Mfg. Co., John M., Naugatuck, Conn.  
 Rust Products Co. of America, 618 W. Adams St., Chicago.  
 Rusticide Products Co., 3125 Perkins Ave., Cleveland.  
 Rutland Fire Clay Co., 91 Curtis Ave., Rutland, Vt.  
 •Rybolt Heater Co., Miller St., Ashland, O.  
 •Ryerson & Son, Inc., Joseph T., 2558 W. 16th St., Chicago.  
 Ryniker Sheet Metal Works, Inc., 122-124 N. 25th St., Billings, Mont.

## S

S K F Industries, Inc., Front St. & Erie Ave., Philadelphia.  
 Saffee Glass Co., Stenton Ave. & Loudon St., Philadelphia.  
 Saino Mfg. Co., Inc., F. L., 70 W. Colorado Ave., Memphis, Tenn.  
 St. Charles Mfg. Co., St. Charles, Ill.  
 St. Clair Foundry Corp., Beech & Wilson Sts., Centralia, Ill.  
 •St. Louis Furnace Mfg. Co., 2901 Elliot Ave., St. Louis, Mo.  
 St. Louis Tool Co., 2319 N. 9th St., St. Louis.  
 St. Paul Corrugating Co., Wabasha & Water Sts., St. Paul, Minn.  
 •Sall Mountain Co., 176 W. Adams St., Chicago, Ill.  
 Sampsel Time Control, Inc., Spring Valley, Ill.  
 Samson Plaster Board Co., Crosby Bldg., Buffalo, N. Y.  
 Sangamo Electric Co., 1301 N. 11th St., Springfield, Ill.  
 Sanmyer Corporation, 1265 W. North Ave., Chicago.  
 Sandberg Co., H. J., 500 N. E. Union Ave., Portland, Ore.  
 Sarco Co., Inc., 475 Fifth Ave., New York City.  
 Sauereisen Cements Co., 2341 Main St., Sharpsburg Station, Pittsburgh, Pa.  
 Savage Co., W. J., 912 W. Clinch Ave., Knoxville, Tenn.  
 Schaefer Brush Mfg. Co., 117 W. Walker St., Milwaukee.  
 Schatz Mfg. Co., Fairview, Poughkeepsie, N. Y.  
 Schatz Venetian Blinds, Los Angeles, Cal.  
 Schecter Brothers Co., Hancock & Huntington Sts., Philadelphia.  
 Schieren Co., Chas. A., 30-38 Ferry St., New York City.  
 Schill Mfg. Co., 302 Mansfield St., Crestline, O.  
 Schlegel Sheet Metal Works, 312-320 Piquette Ave., Detroit.  
 Schoedinger Co., F. O., 322-358 Mt. Vernon Ave., Columbus, O.  
 Schundler & Co., Inc., F. E., Insulation Div., 504 Railroad St., Joliet, Ill.  
 Schwab Furnace Company, 193 S. Second St., Milwaukee.  
 Schwab Safe Co., East Main & Blvd., Lafayette, Ind.  
 •Schwitzer-Cummins Co., 1125 Massachusetts Ave., Indianapolis, Ind.  
 Scientific Instrument Co., 531-35 W. Larned St., Detroit.  
 Scott Engineering Co., 23 N. Sixth St., Noblesville, Ind.  
 Scott-Newcomb, Inc., 1922 Pine St., St. Louis, Mo.  
 Scovill Mfg. Co., Morency-Van Buren Div., Prairie Ave., Sturgis, Mich.  
 •Scully Steel Products Co., 1319 W. Wabansia, Chicago.  
 Sealkote Corp., 40 S. Clinton St., Chicago, Ill.  
 Seamlex Co., 5-19 48th Ave., Long Island City, N. Y.  
 Season-Aire Corporation of America, 20 Bartlett St., Detroit.  
 Security Manufacturing Co., 1630 Oakland Ave., Kansas City, Mo.  
 Self-Vulcanizing Rubber Co., Inc., 605 W. Washington Blvd., Chicago, Ill.  
 Semco Mfg. Co., 118 Third Ave., N., Nashville, Tenn.  
 Seneca Rock Wool Co., 501 E. Market St., Tiffin, Ohio.  
 Seneca Wire & Mfg. Co., Fostoria, Ohio.  
 Sentry Mfg. Co., N. E. Cor. 13th & Grace Sts., Omaha, Nebr.  
 Serval, Inc., Electric Ref. & Air Cond. Div., 119 Morton Ave., Evansville, Ind.  
 Service Machine Co., 750-760 Broadway, Elizabeth, N. J.  
 Service to Industry, Box 133, West Hartford, Conn.  
 Shafer Bearing Corp., 35 E. Wacker Dr., Chicago.  
 Shakeproof, Inc., 2501 N. Keeler Ave., Chicago.  
 Shallcross Co., 48th & Grays Ferry Rd., Philadelphia.  
 Shamblen Furnace Parts Co., 231-39 First Ave., Pittsburgh.  
 Sharon Steel Corp., Sharon, Pa.  
 Shedlov Oil Burners, Inc., 717 Third Ave., S. Minneapolis.  
 Sheet Metal Mfg. Co., Inc., 953 Myrtle Ave., Brooklyn.  
 Sheet Metal Products Co., 320 S. Commercial St., Peoria, Ill.  
 Sheet Metal Specialty Company, 3rd & Liberty Ave., Pittsburgh.  
 Sheldon State Products Co., Inc., 4 Main St., Granville, N. Y.  
 Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland.  
 Shreveport Engineering Co., Inc., 1241 Dalzell St., Shreveport, La.  
 Sight Feed Generator Co., 14 N. Tenth St., Richmond, Ind.  
 Signal Electric Mfg. Co., Menominee, Mich.  
 Silent Glow Oil Burner Corp., 1477 Park St., Hartford, Conn.  
 Silent Sioux Oil Burner Corp., Orange City, Ia.  
 Silvercote Products, Inc., 161 E. Erie St., Chicago.  
 Simplex Manufacturing Co., 200 North Main St., Fond du Lac, Wis.  
 Simplex Oil Heating Corp., 21 West St., New York City.  
 Sinker-Davis Co., 230 S. Missouri St., Indianapolis, Ind.

Sioux City Foundry and Boiler Co., East 8th & Division Sts., Sioux City, Iowa.  
 Sipe & Company, James B., Box 8010 S. Hills Branch, Pittsburgh.  
 Sisalkraft Co., The, 205 W. Wacker Dr., Chicago.  
 Skillbeck Mfg. Co., 7432 27th Ave., Kenosha, Wis.  
 Skilsaw, Inc., 5033 Elston Ave., Chicago, Ill.  
 Skinner Co., E. W., 402 Pearl St., Fitchburg, Mass.  
 Skinner Heating & Ventilating Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., 1954 N. 9th St., St. Louis.  
 •Skuttle Sales Company, 12308 Hamilton Ave., Detroit.  
 Sly Mfg. Co., W. W., 4736 Train Ave., Cleveland, O.  
 Small Motors, Inc., 1322 Elston Ave., Chicago.  
 Smidth & Co., F. L., 60 E. 42nd St., New York City.  
 Smith & Kanzler Corp., 516 Lidgerwood Ave., Elizabeth, N. J.  
 Smith, Inc., Winfield H., 114 Eaton St., Springfield, Erie Co., N. Y.  
 Smith Manufacturing Co., Inc., F. A., P. O. Box 509, Rochester, N. Y.  
 Smith-Raymond Co., Columbus, Ga.  
 •Smith, R. E., 1521 Garden Place, Waukegan, Ill.  
 Smith Heater Co., Peter, 6209 Hamilton St., Detroit, Mich.  
 Smith Welding Equipment Corp., 2619-33 Fourth St., S. E., Minneapolis, Minn.  
 Smooth-on Mfg. Co., 568-574 Communipaw Ave., Jersey City, N. J.  
 Snap-On Mfg. Co., 1028 Blue Island Ave., Chicago, Ill.  
 Snap-On Tools Corp., Kenosha, Wis.  
 Sneed, Herbert S., 205 E. 42nd St., New York City.  
 Socony Paint Products Company, 26 Broadway, New York, N. Y.  
 Somers, Inc., H. J., 6063 Wabash Ave., Detroit, Mich.  
 Sonneborn Sons, Inc., L., 88 Lexington Ave., New York City.  
 Sonner Burner Co., 6th & Andrews, Winfield, Kan.  
 Soss Manufacturing Co., 21777 Hoover Rd., Detroit.  
 South Bend Air Products, Inc., 322 E. Colfax, South Bend, Ind.  
 Southbridge Roofing Co., Inc., Hartwell & Chapin Sts., Southbridge, Mass.  
 Souther Iron Co., E. E., 1952 Kienlen Ave., St. Louis.  
 Southern Fan & Blower Co., 1305 S. Lamar St., Dallas, Tex.  
 Southern States Iron Roofing Co., Stiles Ave., Savannah, Ga.  
 Southport Paint Co., Savannah, Ga.  
 Southworth Machine Co., 30 Warren Ave., Portland, Maine.  
 Spartan Electric Company, P. O. Box 509, Rochester, N. Y.  
 Spear Stove & Heater Co., James, 3430 Chestnut St., Philadelphia.  
 Specialty Converters, Inc., East Braintree, Mass.  
 Speedmaster Co., Des Plaines, Ill.  
 •Speedway Mfg. Co., 1854 S. 52nd Ave., Cicero, Ill.  
 Spencer Heater Division Aviation Mfg. Corp., 164 Park St., Williamsport, Pa.  
 Spencer Thermostat Co., 34 Forest St., Attleboro, Mass.  
 Spencer Turbine Co., 484 New Park Ave., Hartford, Conn.  
 Spoehrer-Lange Co., 3723 Commonwealth St., St. Louis.  
 Spray Engineering Co., 103 Central St., Somerville, Mass.  
 Spray Wheel Air Conditioners, Inc., 1320 19th St., Denver, Colo.  
 Spraying Systems Co., 4021F W. Lake St., Chicago, Ill.  
 Sprayo-Flake Co., 2715 Irving Park Blvd., Chicago, Ill.  
 Sprout-Waldron & Co., Muncy, Pa.  
 Spun Steel Corp., 2037 Dueber Ave., S. W., Canton, O.  
 Square D Co., 6060 Rivard St., Detroit, Mich.  
 Stafford Co., N., 1st Ave. & 53rd St., Brooklyn, N. Y.  
 Standard Asbestos Mfg. Co., 820-22 W. Lake St., Chicago, Ill.  
 Standard Computing Scale Co., Air Conditioning and Refrigeration Div., 2461 E. Grand Blvd., Detroit.  
 Standard Engineering Works, 289 Roosevelt Ave., Pawtucket, R. I.  
 Standard Fuel Engineering Co., 667 Post Ave., South, Detroit, Mich.  
 Standard Furnace & Supply Co., 407-13 S. 10th St., Omaha, Nebr.  
 Standard Galvanizing Co., 2619 W. Van Buren St., Chicago.  
 Standard Heater & Oil Equipment Co., 245 Cornelson Ave., Jersey City, N. J.  
 Standard Heating & Radiator Co., 704 Second Ave., Pittsburgh, Pa.  
 Standard Lime & Stone Co., 2004 First National Bank Bldg., Baltimore, Md.  
 Standard Pressed Steel Co., Jenkintown, Pa.  
 Standard Products Co., Fisher Building, Detroit.  
 Standard Rolling Mills, Inc., 143 Jewel St., Brooklyn, N. Y.  
 •Standard Stamping & Perforating Co., 3137 W. 49th Pl., Chicago, Ill.  
 Standard Steel Spring Co., 2640 E. Fifth Ave., Gary, Ind.  
 Standard Stoker Corporation, New Albany, Ind.  
 Standard Thermometer, Inc., 65 Shirley St., Boston.  
 •Stanley Electric Tool Div., The Stanley Works, 131 Elm St., New Britain, Conn.  
 Stanley Mfg. Co., East Monument Ave., Dayton, O.  
 Stanley Tools, New Britain, Conn.  
 Stanton Heater Co., Martins Ferry, O.  
 Star Electric Motor Co., 197 Grove St., Bloomfield, N. J.  
 Star Expansion Bolt Co., 147 Cedar St., New York City.  
 Starr Plano Co., Richmond, Ind.  
 Staynew Filter Corp., 25 Leighton Ave., Rochester, N. Y.  
 Steamalre Co., Dana Ave. & Newton St., Cincinnati, Ohio.



Steel Products Engineering Co., Columbia St. at Dakota Ave., Springfield, O.  
 Steinhurst & Sons, Inc., Emil, 612 South St., Utica, N. Y.  
 Stephens-Adamson Mfg. Co., Ridgeway Ave., Aurora, Ill.  
 Stephens Mfg. Co., 2507 E. 15th St., Tulsa, Okla.  
 Sterling Electric Motors, Inc., 5401 Telegraph Rd., Los Angeles.  
 Sterling Foundry Co., Sterling, Ill.  
 Sterling Pump Corporation, Hamilton, Ohio.  
 Ster-Na-Man Fdry. Co., 441 Williams St., Springfield, Ill.  
 Stewart Foundry, O. S., 837 E. 67th St., Cleveland, O.  
 Stewart Ice Machine Co., 1046 East 22nd St., Los Angeles.  
 Stiglitz Furnace & Foundry Co., 2007-23 Portland Ave., Louisville, Ky.  
 Stok-A-Fire Co., Inc., 6504 Olive Street Road, University City, Mo.  
 Stokerette Mfg. Co., 4540 Ravenswood Ave., Chicago, Ill.  
 Stoker-Lad, Inc., 1111 A St., Tacoma, Wash.  
 Stokermatic Co., 1415 S. State St., Salt Lake City, Utah.  
 Stoker Products, Inc., 221 W. Prairie Ave., Decatur, Ill.  
 Stokerunit Corp., 4548 W. Mitchell St., Milwaukee.  
 Stokes, Jr., J. W., successor to American Coppercote, Inc., 189 Montague St., Brooklyn, N. Y.  
 Stossel & Sons, Carl, Front Royal, Va.  
 Stove Manufacturers Corporation, 182 Mulberry St., Newark, N. J.  
 Stover Mfg. & Engine Co., N. Henderson Ave., Freeport, Ill.  
 Stow Mfg. Co., 400 State St., Binghamton, N. Y.  
 Strandwitz & Co., Inc., W. J., Jefferson and Master St., Camden, N. J.  
 Stratton & Terstegge Co., 15th & Main St., Louisville, Ky.  
 Streamline Pipe & Fittings Div., Mueller Brass Co., Port Huron, Mich.  
 Streine Tool & Mfg. Co., New Bremen, Ohio.  
 Structural Slate Co., Robinson Ave., Pen Argyl, Pa.  
 Struthers Dunn, Inc., 1315 Cherry St., Philadelphia.  
 • Sturtevant Co., B. F., Damon St., Hyde Park, Boston, Mass.  
 Sundstrand Engineering Co., 1327 Seventh St., Rockford, Ill.  
 Sun-Ray Oil Burner Corp., 114-02 Beach Channel Dr., Rockaway Park, N. Y.  
 Sunstrand Pump Division, 2530 Eleventh St., Rockford, Ill.  
 Super Radiator Corp., 652 Stinson Blvd., Minneapolis.  
 • Superior Sheet Steel Co., The, Division of Continental Steel Corp., Canton & Louisville Rd., Canton, O.  
 Superior Steel Corp., Grant Bldg., Pittsburgh, Pa.  
 Supreme Air Filter Co., 126 W. 21st St., New York City.  
 Supreme Electric Products Corp., 123 Ames St., Rochester, N. Y.  
 Supreme Heater & Ventilating Corp., 1911 N. Market St., St. Louis, Mo.  
 Sure Comfort Furnace Co., 1212 S. Elmwood Ave., Berwyn, Ill.  
 • Surface Combustion Corp., 2375 Dorr St., Toledo, O.  
 Susquehanna Engineering Co., Ninth & Iron Sts., Bloomsburg, Pa.  
 Sutphen & Co., J. W., 150 S. LaBrea Ave., Los Angeles, Cal.  
 Swaby Mfg. Co., 2330 W. Cermak Rd., Chicago, Ill.  
 Swaine Mfg. Co., Fred J., 1300 N. Seventh St., St. Louis, Mo.  
 • Swartwout Co., 18615 Euclid Ave., Cleveland, O.  
 Swedish Venetian Blinds, 601 W. 26th St., New York City.  
 Swift, Carl E., 369 Lincoln Ave., Holland, Mich.  
 Swift Mfg. Company, 247 McDougall Ave., Detroit, Mich.  
 Swing-A-Way Steel Products, Inc., 1439 Merchandise Mart, Chicago.  
 Synco-Flame Burner Corp., 57 North St., Willimantic, Conn.  
 Synchronic Air Conditioning Corporation, 3373 North Holton St., Milwaukee.  
 Syntroon Co., Homer City, Pa.  
 Syracuse Fire Door Corp., 900 Canal St., Syracuse, N. Y.

## T

Taco Heaters, Inc., 342 Madison Ave., New York City.  
 Tagliabue Mfg. Co., C. J., Park & Nostrand Aves., Brooklyn.  
 Tammis Silica Co., 228 N. La Salle St., Chicago, Ill.  
 Tannewitz Works, 315 Front Ave., N. W., Grand Rapids, Mich.  
 Taylor Engineering Co., Metropole Hotel, Cincinnati.  
 Taylor-Hall Welding Corp., 99 Hope Ave., Worcester, Mass.  
 Taylor Instrument Companies, 95 Ames St., Rochester, N. Y.  
 Taylor-Winfield Corp., 1052 Mahoning Ave., N. W., Warren, O.  
 Technical Coatings, Inc., 50 Broad St., Brooklyn, N. Y.  
 Tecumseh Products Co., Tecumseh, Mich.  
 Telsit Insulation Co., 1933 West Farms Road, Bronx, N. Y.  
 Tem Products Co., Midland, Pa.  
 Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham, Ala.  
 Tenney Engineering, Inc., 46 Farrand St., Bloomfield, N. J.  
 Tennessee Enamel Mfg. Co., Nashville, Tenn.  
 Tennessee Products Corp., American Natl. Bk. Bldg., Nashville, Tenn.  
 Thatcher Furnace Company, 39 St. Francis St., Newark, N. J.  
 Thermal Engineering Associates, 1618 North Shore Ave., Chicago.  
 Therminul Corp., 1603 Fulford St., Kalamazoo, Mich.  
 Thermold Rubber Div. of Thermold Co., Whitehead Rd., Trenton, N. J.  
 Thompson & Company, 1085 Allegheny Ave., Oakmont (Pittsburgh Dist.) Pa.

Thomson-Gibb Electric Welding Co., 161 Pleasant St., Lynn, Mass.  
 ThruBond Flashing Corp., 1204 Washington Ave., New York City.  
 Tierney Rotor Ventilator Co., 239 4th Ave., S., Minneapolis.  
 Tiffin Eaves Trough Clamp Co., 25 Miami St., Tiffin, Ohio.  
 Tilco-Fin, Inc., 58 Second Ave., Brooklyn, N. Y.  
 Timken Roller Bearing Co., Canton, O.  
 Timken Silent Automatic Div., Timken-Detroit Axle Co., 100 Clark Ave., Detroit, Mich.  
 Timm & Son, P. C., 2626 C St., Lincoln, Nebr.  
 Tinnerman Products, Inc., 2038-46 Fulton Road, Cleveland.  
 TiteFlex Metal Hose Co., 500 Frelinghuysen Ave., Newark, N. J.  
 Toch Brothers, Inc., 2600 Richmond Ter., Elm Park, S. I., N. Y.  
 Todd Air Conditioning Co., Inc., Bonner Springs, Kan.  
 Todd Combustion Equipment, Inc., 601 W. 26th St., New York, N. Y.  
 Toledo Stoker Co., 48 Blucher St., Toledo, O.  
 Torch Weld Equipment Div. National Cylinder Gas Co., 1035 W. Lake St., Chicago, Ill.  
 Torit Manufacturing Co., 292 Walnut St., St. Paul, Minn.  
 Tork Clock Co., Inc., 1 Grove St., Mt. Vernon, N. Y.  
 Torrington Mfg. Co., 70 Franklin St., Torrington, Conn.  
 Townsend Co., New Brighton, Pa.  
 Trade-Wind Motor Fans, Inc., 5725 S. Main St., Los Angeles.  
 Trane Co., The, La Crosse, Wis.  
 Trerice Co., H. O., 1420 W. Lafayette Blvd., Detroit, Mich.  
 • Triangle Manufacturing Co., Oshkosh, Wis.  
 Trimount Rotary Power Co., 296 Whiting Ave., East Dedham, Mass.  
 Trindl, Inc., Jos. H., 2613 S. Michigan Blvd., Chicago.  
 Trindl Products, Ltd., 2227 Calumet Ave., Chicago.  
 Triplex Mfg. Co., Peru, Ind.  
 Tropic-Air Stoker Co., New London, Ohio.  
 Tropical Paint & Oil Co., 1244-36 W. 70th St., Cleveland, O.  
 Trumbull Electric Mfg. Co., Woodford Ave., Plainville, Conn.  
 Truffo Fan Co., 523 Main St., Harmony, Pa.  
 Truscon Laboratories, Caniff & Grand Trunk R. R., Detroit.  
 Truscon Steel Co., Albert St., Youngstown, O.  
 Tubular Rivet & Stud Co., Wollaston, Mass.  
 Turner & Seymour Mfg. Co., Lawton St., Torrington, Conn.  
 Turner Brass Works, 823 Park Ave., Sycamore, Ill.  
 Tuthill Pump Company, 939 E. 95th St., Chicago.  
 Tuttle Air Filter Co., Inc., 1014 W. Main St., Louisville, Ky.  
 • Tuttle & Bailey, Inc., Corbin Ave., New Britain, Conn.  
 Twentieth Century Heating & Ventilating Co., Ira & Edison Ave., Akron, O.

## U

Uehling Instrument Co., 473 Getty Ave., Paterson, N. J.  
 Una Welding, Inc., 1615 Collamer Ave., Cleveland, O.  
 Unified Air Conditioner Co., 322 W. Michigan St., Duluth, Minn.  
 Uniflow Mfg. Co., East Lake Road, Erie, Pa.  
 U-Ni-Matic Heating Systems, Inc., 1303 W. Slauson Ave., Los Angeles, Cal.  
 Union Manufacturing Co., Inc., 6th & Washington Sts., Boyertown, Pa.  
 Union Rock Wool Corp., Chestnut St., Wabash, Ind.  
 Union Steam Pump Co., S. W. Capital Avenue, Battle Creek, Mich.  
 United American Bosch Corp., 3664 Main St., Springfield, Mass.  
 United Cork Companies, Central Ave. & N. J. Central R. R., Kearny, N. J.  
 United Electric Controls Co., 69 "A" St., South Boston.  
 United Metal Hose Co., Inc., 36-01 43rd Ave., Long Island City, N. Y.  
 United Metal Prod. Div., Canton, Ohio.  
 • U. S. Air Conditioning Corp., 2101 Kennedy St., N. E., Minneapolis, Minn.  
 United States Brass & Copper Co., Hyde Park Ave., Hyde Park, Mass.  
 United States Burner Corp., Wethersfield, Conn.  
 U. S. Eastern Filter Mfg. Co., The, 509 S. McClun St., Bloomington, Ill.  
 U. S. Electrical Motors, Inc., 200 E. Slauson Ave., Los Angeles.  
 U. S. Expansion Bolt Co., Inc., P. O. Box 827, York, Pa.  
 United States Electrical Tool Co., 2482 W. 6th St., Cincinnati, O.  
 U. S. Gutta Percha Paint Company, 14 Dudley St., Providence, R. I.  
 United States Gypsum Co., 300 W. Adams St., Chicago, Ill.  
 U. S. Machine Corporation, Lebanon, Ind.  
 United States Mineral Wool Co., 9 S. Clinton St., Chicago.  
 United States Ozone Co. of America, Crescent St., Scottsdale, Pa.  
 United States Radiator Corp., 1056 National Bank Bldg., Detroit, Mich.  
 • United States Register Co., Burnham St., Battle Creek, Mich.  
 U. S. Rock Wool Co., 40 S. Main, Salt Lake City.  
 United States Rubber Co., 1790 Broadway, New York City.  
 United States Steel Co., 436 Seventh Ave., Pittsburgh, Pa.  
 U. S. Stoneware Company, Akron, Ohio.  
 Uni-Therm Products Co., P. O. Box 83, Elyria, O.

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Universal Air Filter Corp., 332 W. Michigan St., Duluth, Minn.  
 Universal Blower Co., 124 S. Woodward Ave., Birmingham, Mich.  
 Universal Cooler Corp., Marion, Ohio.  
 Universal-Cyclops Steel Corp., Bridgeville, Pa.  
 Universal Gypsum & Lime Co., 111 W. Washington St., Chicago.  
 Universal Manufacturers, Inc., Midland Park, N. J.  
 Universal Power Corporation, 4300 Euclid, Cleveland.  
 Universal Zonolite Insulation Co., 135 S. LaSalle St., Chicago.  
 Uno Ventilator Co., 565 Lincoln Ave., Cliftondale Station, Saugus, Mass.  
 Upton Co., The, Upton Point, Lockport, N. Y.  
 •Utility Fan Corporation, 4851 S. Alameda St., Los Angeles.

## V

Vacuum Gas Appliance Div., Union Fork & Hoe Co., Rome, N. Y.  
 Vall Mfg. Co., 1017 Columbia Ave., Fort Wayne, Ind.  
 Valley Mfg. Co., Fryeville, Athol, Mass.  
 Van Dorn Electric Tool Co., Towson, Md.  
 Van Noorden Co., E. 100 Magazine St., Boston, 19, Mass.  
 Van Praag Sales, 22 East 17th St., New York City.  
 Vendor Slate Co., Inc., P. O. Box 204, Nazareth, Pa.  
 Ventilating Products Co., 2800 Cottage Grove Ave., Chicago.  
 Vent-O-Lite Co., 4230 W. Taylor St., Chicago, Ill.  
 Vermont Structural Slate Co., Fair Haven, Vermont.  
 •Version Allsteel Press Co., 1351 E. 93rd St., Chicago.  
 Vibration Eliminator Co., 8-22 Astoria Blvd., Astoria, N. Y.  
 •Victor Electric Products, Inc., 2950 Robertson Road, Cincinnati, Ohio.  
 Victor Equipment Co., 844 Folsom St., San Francisco.  
 Victor Oil Burner Mfg. Co., 250 Pleasant St., Hartford, Conn.  
 Vigor-Aire Corp., 127 S. 5th St., Philadelphia.  
 Viking Air Conditioning Corp., 5600 Walworth Ave., Cleveland, O.  
 Viking Mfg. Corp., 1234 Ray St., Dayton, Ohio.  
 Viking Pump Co., 404 State St., Cedar Falls, Ia.  
 Viking Shear Co., Inc., 1063 19th St., Erie, Pa.  
 Vilter Mfg. Co., 2217 S. First St., Milwaukee, Wis.  
 Vita-Screen Ventilator Co., 103 Park Ave., New York City.  
 Volcano Burner Corp., 3612 E. Tremont Ave., New York City.  
 Vortex Mfg. Co., 687 N. Tillamook St., Portland, Ore.  
 Vulcan Electric Co., 88 Holten St., Danvers, Mass.  
 Vulcan Metal Products Company, 1st Ave. at 39th St., N., Birmingham, Ala.

## W

Wagner, C. DeWitt, 1000 S. 2nd St., Cedar Rapids, Ia.  
 Wagner Electric Corp., 6400 Plymouth Ave., St. Louis, Mo.  
 Walles Dove-Hermiston Corp., Westfield, N. J.  
 Waldron Corp., P. O. Box 110, John, New Brunswick, N. J.  
 •Walker Mfg. & Sales Corp., 1711-1717 Penn St., St. Joseph, Mo.  
 Wall Mfg. Supply Company, P., 3126 Preble Ave., N. S. Pittsburgh.  
 •Walsh Refractories Corp., 4070 N. First St., St. Louis.  
 Walworth Co., 60 E. 42nd St., New York City.  
 Ward Co., Edgar T., Inc., 7777 W. Lake St., River Forest, Ill.  
 Ward Co., H. H., Chester, Pa.  
 Ward Heater Co., 1800 W. Washington Blvd., Los Angeles, Cal.  
 Ward Leonard Electric Co., 37 South St., Mt. Vernon, N. Y.  
 •Ward Machinery Co., 564 W. Washington Blvd., Chicago.  
 Ward Mfg. Co., Plymouth, Mich.  
 Warren Handle Works Co., 1100 Pearl St., Cortland, Ohio.  
 Warren Shade Co., Inc., 2905 E. Hennepin Ave., Minneapolis.  
 Washburne & Co., E. G., 207 Fulton St., New York City.  
 Washington Stove Works, 3402-22 Smith Ave., Everett, Wash.  
 Waterloo Register Co., 2520 E. Fourth St., Waterloo, Ia.  
 Water Cooling Corporation, 71 Nassau St., New York City.  
 •Waterman-Waterbury Co., 1122 Jackson St., N. E. Minneapolis, Minn.  
 Wattenamel Co., 7400 Archer Ave., Summit, Ill.  
 Waukesha Lime & Stone Co., Waukesha, Wis.  
 Waverly Heating Supply Co., 31 Union St., Boston, Mass.  
 Wayne Automatic Relay Co., 622 Wagner St., Fort Wayne, Ind.  
 Wayne Oil Burner Corp., 800 Glasgow Ave., Fort Wayne, Ind.  
 Wayne Pattern & Foundry Co., 236 Murray St., Fort Wayne, Ind.  
 Weatherall Engineers, Inc., 3 Friendship St., Providence, R. I.  
 Weatherhead Co., 300 E. 131st St., Cleveland, O.  
 Weaver Mfg. Co., Heating Plant Div., Springfield, Ill.  
 Webster & Co., Warren, 17th & Federal St., Camden, N. J.  
 Webster Electric Co., DeKoven & Clark Sts., Racine, Wis.  
 Webster Engineering Co., 419 W. 2nd St., Tulsa, Okla.  
 Weil Pump Co., Wells & Superior St., Chicago, Ill.

Weinman Pump Mfg. Co., 290 Spruce St., Columbus, O.  
 Weirton Steel Co., Weirton, W. Va.  
 Weiss & Co., H., 113-115 Mercer St., New York City.  
 Weksler Thermometer Corp., 52-54 W. Houston St., New York City.  
 Weldex, Inc., 7326 McDonald Ave., Detroit, Mich.  
 Welding Apparatus Co., 2750 W. Van Buren St., Chicago, Ill.  
 Wells Mfg. Corp., 315 Seventh Ave., Three Rivers, Mich.  
 Western Blower Co., 1800 Airport Way, Seattle, Wash.  
 Western Engineering & Mfg. Co., 1726 E. Washington Blvd., Los Angeles.  
 Western Felt Works, 4027 Ogden Ave., Chicago, Ill.  
 Western Furnaces, Inc., 950 Commerce St., Tacoma, Wash.  
 Western Rock Wool Corp., P. O. Box 545, Huntington, Ind.  
 Western Precipitation Corp., 1016 W. 9th St., Los Angeles.  
 Western Mineral Products Co., Omaha, Nebr.  
 Western Silicair Products, Inc., 72 S. Alameda Ave., Burbank, Cal.  
 Western Venetian Blind Co., 601 W. 26th St., New York City.  
 Western Wire & Iron Works, Inc., 945 W. 18th Pl., Chicago.  
 Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., Springfield, Mass., and Cleveland.  
 Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark, N. J.  
 Westwick & Son, Inc., John, Claude & Meeker Sts., Galena, Ill.  
 Wheelco Instruments Co., Harrison & Peoria Sts., Chicago, Ill.  
 Wheeling Corrugating Co., Wheeling Steel Bldg., Wheeling, W. Va.  
 Wheeling Furnace Corporation, Martins Ferry, Ohio.  
 Wheeling Steel Corp., Wheeling Steel Bldg., Wheeling, W. Va.  
 White & Company, Haydn F., 1740 E. 12th St., Cleveland.  
 •White Mfg. Co., 2362 University Ave., St. Paul, Minn.  
 •White-Rodgers Electric Co., 1209 Cass Ave., St. Louis, Mo.  
 Whitney Chain & Mfg. Co., Bartholomew Ave., Hartford, Conn.  
 •Whitney Mfg. Co., W. A., 636 Race St., Rockford, Ill.  
 •Whitney Metal Tool Co., 91 Forbes St., Rockford, Ill.  
 Wickwire Spencer Steel Co., 500 Fifth Ave., New York City.  
 Wiedemann Machine Co., 1815 Sedgley Ave., Philadelphia.  
 Wilder Mfg. Co., P. O. Box 189, Niles, O.  
 Wilhelm Co., A., 3rd & Bern Sts., Reading, Pa.  
 Will-Burt Co., Orrville, O.  
 Williams Oil-O-Matic Heating Corp., 1201 E. Bell, Bloomington, Ill.  
 Williams-Wallace Co., 160 Hooper St., San Francisco.  
 •Williamson Heater Co., 337 W. Fifth St., Cincinnati, O.  
 •Willis Steel Corporation, 156 N. Academy St., Galesburg, Ill.  
 Will-Weld Mfg. Co., Inc., 600 S. 15th St., Omaha, Nebr.  
 Willy's Carbide Tool Company, 1340 W. Vernor Highway, Detroit.  
 Wilson & Co., Inc., 4100 S. Ashland Ave., Chicago, Ill.  
 Wilson Co., The H. A., 105 Chestnut St., Newark, N. J.  
 Wilson Company, Ludwig, 223 W. Congress St., Chicago.  
 •Wilson, Inc., Grant, 4101 W. Taylor St., Chicago, Ill.  
 Wilson Products, Inc., 348 Thorn St., Reading, Pa.  
 Wilson Welder & Metals Co., Inc., 60 E. 42nd St., New York City.  
 Wilster Air Devices, Inc., 5700 Detroit Ave., Cleveland.  
 Wind-Way Fan & Ventilator Co., Inc., 527 St. Joseph St., New Orleans, La.  
 Wing Mfg. Co., L. J., 154 W. 14th St., New York City.  
 Wisconsin Heating & Draft Control Co., 156 Lake Drive, Oshkosh, Wis.  
 •Wise Furnace Co., 101 Lincoln St., Akron, Ohio.  
 •Wiss & Sons Co., J., 11-45 Littleton Ave., Newark, N. J.  
 Wittenmeier Machinery Co., 850 N. Spaulding Ave., Chicago, Ill.  
 •Wodack Electric Tool Corp., 4644 W. Huron St., Chicago.  
 Wolverine Tube Co., 1419 Central Ave., Detroit, Mich.  
 Wood Conversion Co., First National Bank Bldg., St. Paul, Minn.  
 •Wood Industries, Inc., Gar, 7924 Riopelle St., Detroit, Mich.  
 Wood Steel Co., Alan, Conshohocken, Pa.  
 Woodhill Chemical Co., 3708 E. 93rd St., Cleveland.  
 Woods-Evertz Stove Co., Springfield, Mo.  
 Wood's Sons Co., T. B., Fifth Ave., Chambersburg, Pa.  
 Woolery Machine Co., 2919 Como Ave., S. E., Minneapolis.  
 Woolwine Metal Products Co., Atlantic Blvd. & S. Riverside Dr., Los Angeles, Cal.  
 Wooster Art Wood, Inc., P. O. Box 198, Wooster, O.  
 Worcester Brush & Scraper Co., Div. Mason Worcester Co., 38 Austin St., Worcester, Mass.  
 Worcester Pressed Steel Co., 99 Barber Ave., Worcester, Mass.  
 Worthington Pump & Machinery Corp., Harrison, N. J.  
 Wyoming Stoker Worm Co., Wyoming, Pa.

## X

XL Refrigerating Co., Inc., 1834 W. 59th St., Chicago, Ill.  
 X-Pando Corp., 43-15 36th St., Long Island City, N. Y.  
 XXth Century Heating & Ventilating Co., Ira & Edison Ave., Akron, O.

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# Y

Yardley Venetian Blind Co., 138 Parsons Ave., Columbus, Ohio.  
 Yarnall-Waring Company, Chestnut Hill, Philadelphia, Pa.  
 Yates-American Machine Co., Beloit, Wis.  
 Yeomans Bros. Co., 1433 Dayton St., Chicago, Ill.  
 Yoder Co., 5500 Walworth Ave., Cleveland, O.  
 York Corrugating Co., Adams St. & WM RR., York, Pa.  
 York Ice Machinery Corp., Roosevelt Ave., York, Pa.  
 York Oil Burner Co., Inc., Jessop Place & P. R. R., York, Pa.  
 Young & Bertke Co., 1004-1014 Hulbert Ave., Cincinnati, O.  
 Young Radiator Co., 709 Marquette St., Racine, Wis.

Young Regulator Co., 4500 Euclid Ave., Cleveland, O.  
 Youngstown Sheet & Tube Co., Stambaugh Bldg., Youngstown, O.

# Z

Zapon-Brevolite Div. Atlas Powder Co., North Chicago, Ill.  
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 Zimmerman, R. F., Paxton & Marbury Sts., Cincinnati.  
 ● Zink Co., John, 4401 S. Peoria St., Tulsa, Okla.  
 Zobel Electric Motor Corp., Garwood, N. J.

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